JANUARY, 1957

TRAFFIC ENGINEERING

- The Federal-Aid Highway Program
- Men — Money — Modern Methods
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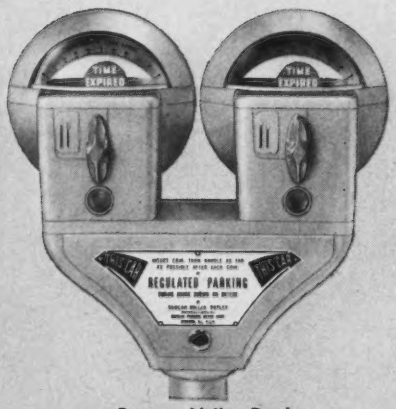

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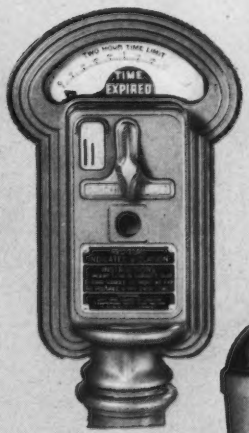

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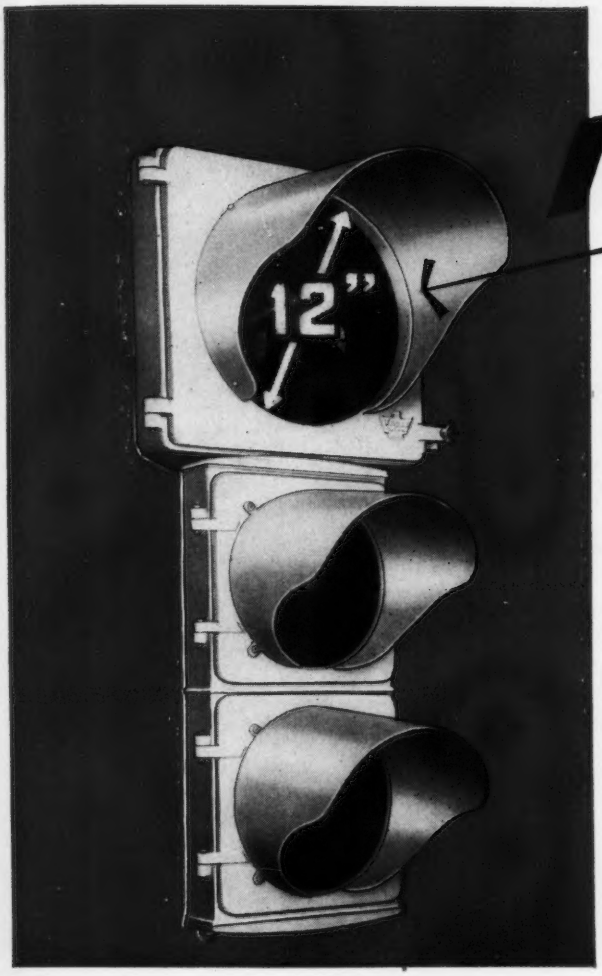

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TRAFFIC ENGINEERING

OFFICIAL PUBLICATION OF THE INSTITUTE OF TRAFFIC ENGINEERS

Vol. 27 JANUARY, 1957 Number 4

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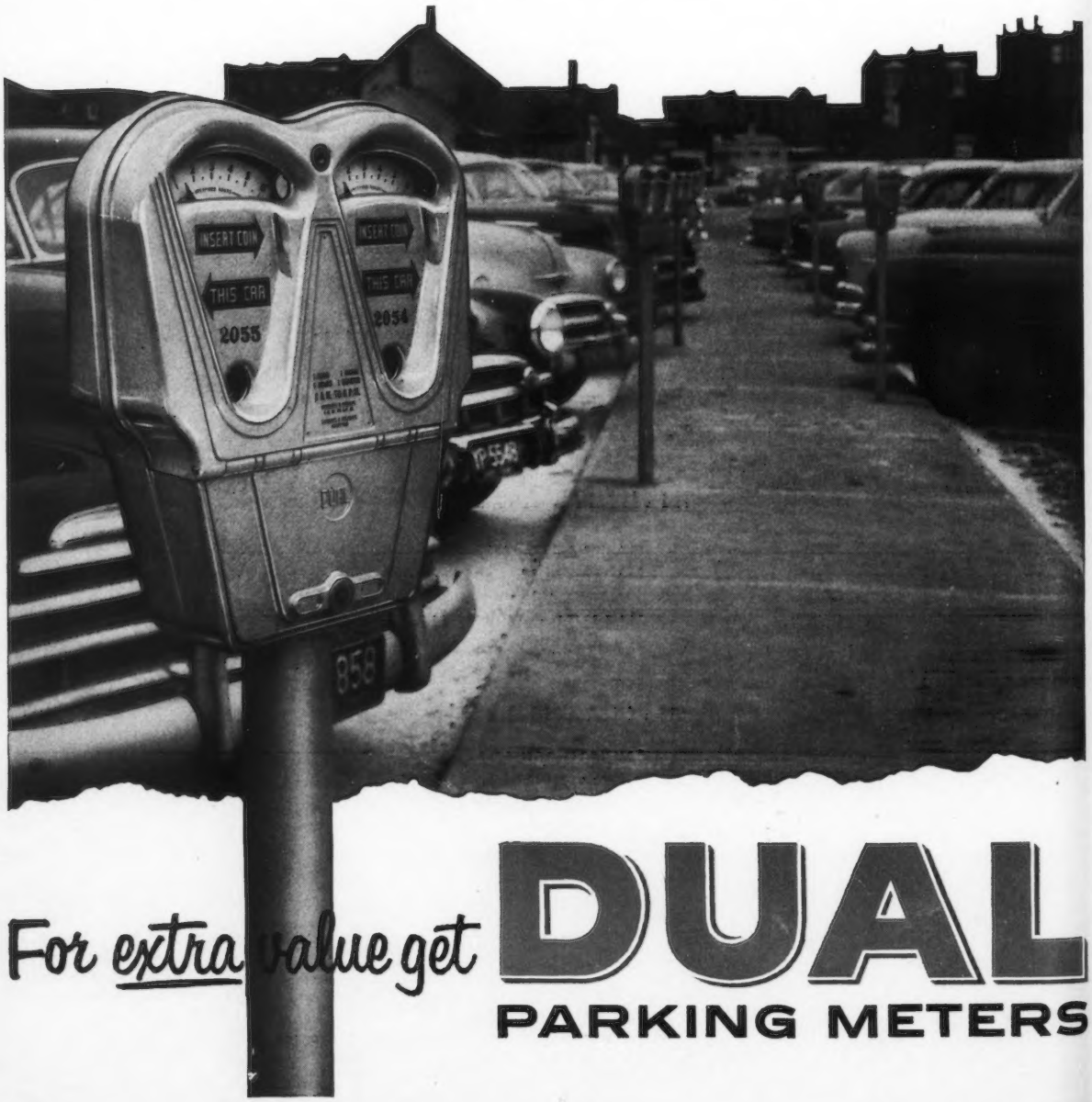

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Frankly Speaking . . .

THE TRANSITION IN NATURE of the urban traffic engineer's job in recent years is a change which has taken place so insistently, in response to a need, that few of the persons directly concerned were aware of the change.

The city traffic engineer has moved from "gadgeteer" and "traffic-safety engineer," to the position of essential administrator in city government, in less than 25 years. His main assignment today is efficiency in use of existing and future streets and highways.

Participation in the planning of expressways and allied major improvements, in the planning of traffic facilities for urban redevelopment projects and for shopping centers, are normal assignments in the work of the urban area traffic engineer.

Off-street parking—its planning, development and even its administration—may well fall within the province of the city traffic man.

Mass transit tends to put its problems more and more into the hands of experienced street traffic men—and the city traffic engineer can make substantial progress by handling transit problems on a factual basis.

The idea of closing downtown core area streets to all but pedestrians and mass transit vehicles has taken on new dignity with the publication of recent urban planning reports. The city traffic engineer will shudder at the thought of closing down used-and-useful street capacity—yet this is an idea which he may be forced to consider as downtown planning progresses.

Adding to the complexity of the job, even conventional traffic control devices require better knowledge of traffic characteristics than was readily available to most city traffic engineers in the recent past. Electronic devices, remote control, part-time restrictions, lane control and allied techniques of relatively recent development require added precision in traffic study methods. Sampling and simulation take on added importance as the need for conserving manpower in traffic studies becomes more apparent.

Notwithstanding all of these outward evidences of progress, one of the oldest problems of traffic control in urban areas, the pedestrian, still stands as the one big unsolved question. Little real progress has been made in this field, though it is true that fewer pedestrians are being killed today in urban areas "per million miles of travel" or "per thousands of motor vehicle registration."

New and old problems alike are a challenge which make the work of the traffic engineer in an urban area of the utmost importance. We have need for a broad look about us, to rise to the full stature which the job demands.

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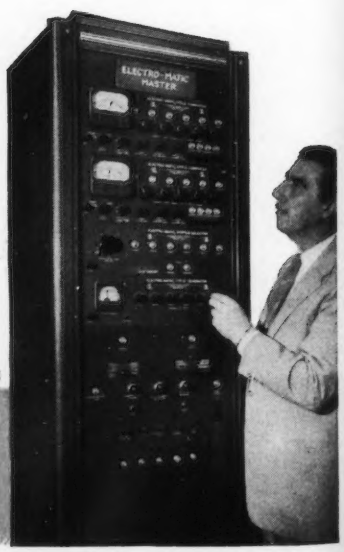

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The Federal-Aid Highway Program

By C. D. Curtiss

(Hon. Mem., ITE)

Commissioner of Public Roads

This is the text of an address delivered by Mr. Curtiss at the 42nd Annual Meeting of the American Association of State Highway Officials in Atlantic City on November 27, 1956.

WHEN PRESIDENT EISENHOWER signed the 1956 Federal Highway Act on June 29 it lacked but a few days of being the 40th anniversary of the signing of the Federal-Aid Road Act of 1916. The 1956 Act not only provides for the completion of the Interstate system in a 13-to-15-year period; it also materially increases the regular Federal-aid highway program—primary, secondary and urban. The $850 million and $875 million authorized for the fiscal years 1958 and 1959 compare with an average of $500 million for the first nine postwar years.

The $25 billion authorized for the 13-year period, fiscal year 1957 to fiscal year 1969, is so large as to make full understanding of it practically impossible. Mr. Thruelson in his splendid SATURDAY EVENING POST article compared the 15-year program with the Panama Canal, Grand Coulee Dam and the St. Lawrence Seaway combined and concluded that 29 such projects would about equal the new highway program.

Another comparison may serve to still further emphasize the size of the program authorized by the 1956 Act. More Federal-aid highway funds will be made available to the States in the first four years of the new program than in the preceding 40 years.

I have referred to the 1916 Act. That Act together with the Federal Highway Act of 1921 established a set of principles to guide the Federal-State partnership. The most important are as follows, and while they may be so well known as to be taken for granted, they are of such importance as to bear reiteration:

(1) Cooperation with State highway departments. (Parenthetically I may say that in 1916 there were a number of States without State highway departments and in other States further legislation was required to strengthen the authority of the existing highway departments.)

(2) Federal-aid funds to be expended in the improvement of selected systems.

(3) Initiative in the selection of systems, route locations and projects for improvement rests with the States.

(4) State highway departments make the surveys, prepare plans, let contracts and supervise construction, subject to approval of the Bureau of Public Roads.

(5) States maintain at State expense highways constructed with Federal aid.

(6) State funds are required to match Federal funds. Normal matching is 50-50, with a sliding scale in the West where there are large areas of public lands.

(7) Federal-aid funds are apportioned among the States under formulas stated in the law involving the factors of area, population, and mileage of rural delivery and star mail routes.

The soundness of these principles has been firmly established by four decades of successful operation. I know of no finer example of Federal-State relations.

Cooperative procedures to implement these principles have been developed over the years, are working satisfactorily, and they are being continued in the new program. This fact has enabled the State highway department to get the new program started promptly. As of November 16, 1956, just 4½ months after the new Interstate funds were made available, projects with a total cost of $2.8 billion had been initiated either by a Stage 1 program or an actual construction program. Plans had been approved for projects in 37 States involving a total cost of $269 million and $219 million of Federal funds. Projects were actually under contract in 36 States with a total cost of $180 million and $139 million Federal aid. Also, about $70 million had been programed for advance acquisition of right-of-way in 40 States. These figures refer only to the Interstate system. For the program as a whole, in the four months July to October inclusive, plans were approved for projects involving a total cost of $830 million and $529 million Federal aid.

Although we realize that commendable progress has been made, and that substantial acceleration has taken place, with the increased Federal-aid funds already made available and with more to come annually at an increasing rate for the next few years, greater acceleration is called for. Advance acquisition of right-of-way should be stepped up also in line with the provisions of the 1956 Act.

For the first time a long-range program has been authorized making it possible for everyone concerned to plan ahead and we must take full advantage of it. Much progress has already been made in overcoming the problem inherent in the shortage of engineers. The use of photogrammetry and electronic computers in highway location and design is increasing and the best practices of each State are being made known to other States through a series of regional meetings. Such meetings have been held in Chicago, Albany and Atlanta. Another

one of these meetings is to be held in California in February 1957 through the cooperation of State Highway Engineer George McCoy, the University of California, the Bureau of Public Roads and possibly AASHO or WASHO. All State Highway Engineers, especially those from the western States, and others are invited to attend and participate.

I hope that these developments will be continued and that our universities will be utilized as much as possible in the development and adaption of these new scientific methods to the art and science of highway engineering.

In the Bureau, Mr. H. A. Radzikowski and several associates have been actively engaged for the past two years in working with manufacturers of electronic equipment and State highway departments in adapting these miracle machines to highway engineering procedures. Our Mr. William T. Pryor at the same time has been assisting the States and our own field engineers in photogrammetric methods. Others have been developing equally unique advances in highway planning, traffic studies and research.

Progress is also being made in relieving engineers of nonengineering or subprofessional duties. Training of high school graduates is feasible and should be extended. Training for young engineering graduates not only attracts them to highway work but fits them for higher responsibilities sooner.

By a comprehensive realignment of duties and use of photogrammetry and electronics the Wisconsin Highway Department reduced the number of engineers per million dollars of construction work from 10 to 4 in three years. This is an accomplishment which other States that have not made similar progress might well investigate.

With a long-range program assured the States and cities must improve their cooperative planning to insure proper integration of both the urban and rural highway facilities and to see that the highway program in urban areas is properly integrated with the overall development plan for the area.

The use of standard designs for bridges is being extended. This is a very fertile field for conservation of engineering manpower. Recently the Bureau of Public Roads revised and enlarged its publication titled "Standard Plans for Highway Bridge Superstructures." This revised edition includes three new series; namely, prestressed concrete (post tensioned and pretensioned), precast reinforced concrete, and timber. The purpose of these standard plans is to provide a useful guide to the States in developing designs for bridges of adequate strength and economical proportions for use on primary, secondary and urban highways.

Consulting engineers can and I am sure will be of great help in launching and carrying forward this new highway program. They have an important and legitimate place in the program, particularly where special technical skill is required. They cannot, however, take over the responsibility vested in the State highway departments by the Federal law which requires a State accepting Federal aid to have adequate powers and be suitably equipped and organized to discharge to the satisfaction of the Secretary of Commerce the duties required.

Without going into detail, I wish again to urge an upward adjustment of State highway department salaries —particularly in the top grades. At present there is too little spread between the salary of the engineer just out of college and the one with 20 years' experience—and don't think the 20-year man's salary is of no interest to the young graduate. Opportunity rates high in his acceptance of a job.

Several quotations from the 1956 Act will serve to indicate the great importance which the Congress attaches to the Interstate system.

"*Sec.108*

"It is hereby declared to be essential to the national interest to provide for the early completion of the 'National System of Interstate Highways,' as authorized and designated in accordance with section 7 of the Federal-Aid Highway Act of 1944 (58 Stat. 838)

"It is the intent of the Congress that the Interstate System be completed as nearly as practicable over a thirteen-year period and that the entire system in all the States be brought to simultaneous completion.

"Because of its primary importance to the national defense, the name of such system is hereby changed to the 'National System of Interstate and Defense Highways.'

"The geometric and construction standards to be adopted for the Interstate System shall be those approved by the Secretary of Commerce in cooperation with the State highway departments. Such standards shall be adequate to accommodate the types and volumes of traffic forecast for the year 1975. The right-of-way width of the Interstate System shall be adequate to permit construction of projects on the Interstate System up to such standards. The Secretary of Commerce shall apply such standards uniformly throughout the States.

"*Sec. 112*

"All agreements between the Secretary of Commerce and the State highway department for the construction of projects on the Interstate System shall contain a clause providing that the State will not add any points of access to, or exit from, the project in addition to those approved by the Secretary in the plans for such project, without the prior approval of the Secretary."

This national importance is further emphasized by a provision increasing the Federal share payable on account of any project on the Interstate system to 90 percent of the total cost thereof, with the sliding scale applicable in the public lands States up to 95 percent.

To carry out the provisions I have just quoted with respect to standards, the State highway departments acted promptly. In anticipation of the new legislation, the Association Committee on Planning and Design Policies early began reviewing standards previously adopted for the Interstate system, and so was in a position to take prompt action following passage of the Act. The Association itself also acted promptly on its Committee recommendations and on July 16, 1956, just over two weeks after approval of the Act, the new standards were submitted to the Bureau of Public Roads. They were approved on July 17 under authority delegated by the Secretary of Commerce. These standards are sufficiently high to provide for safe and smooth operation but are not unduly high. Many States are now using standards exceeding them in one or another respect for their more important arterial highways.

It is my firm belief that the most important part of the standards deals with control of access which is mandatory on all Interstate highways. While the most important, it is perhaps the least understood and because

of this objections are often raised by those who fear it will be bad for their community or for their own particular business.

Access control may be explained as "planned access." It is an integral part of the design of a highway in which provision is made for vehicles to enter and leave the highway safely without interference and with the through traffic streams. Experience with many miles of such "planned access" highways has demonstrated that accident rates are reduced by about two-thirds. More public education is necessary. The South Carolina Highway Department has prepared and distributed widely with marked effect on public opinion a pamphlet explaining the advantages of control of access with emphasis on the safety feature.

If the rate of fatal accidents per 100 million miles of traffic experienced in the late thirties had continued, the traffic deaths in 1955 would have exceeded 100,000 instead of the actual total of 38,300. However, there is but small satisfaction in reducing a rate when the actual number of fatalities is increasing. It has been estimated traffic accidents will claim at least 42,000 lives this year. This is an appalling total and calls for increased effort by all with official responsibility and by the special groups devoted to highway safety. However engineering, enforcement, and education cannot without public cooperation accomplish the desired end. If drivers would practice the same courtesy when behind the wheel as they do in their homes and offices our highways would be much safer and many lives would be saved.

While justified by the safety feature alone, control of access is further supported by the fact that it is the only plan that will preserve the traffic capacity initially built into an arterial highway. Experience has shown many highways without the planned access feature have become obsolete and other new routes required.

Shortly the Bureau will issue a new Policy and Procedure Memorandum on right-of-way (21-4.1). In preparing this memorandum we had the active participation of a committee of six outstanding right-of-way specialists appointed at our request for this specific purpose by President Whitton from the Association Committee on Right-of-way. We are very grateful for this help. Right-of-way cost will constitute a rather large percentage of Interstate improvement costs. It is important that right-of-way acquisition be handled with the utmost prudence. The procedures outlined in this memorandum will assist in accomplishing this desired end.

The 1956 Act besides authorizing an unprecedented program of construction calls for five major studies. Responses, to a letter sent to all State highway departments, pledging their cooperation in connection with these studies has been most gratifying. Your help is essential to the successful accomplishment of these studies.

Taking up the studies as they appear in the Act, the first one calls for estimating the cost of completing the Interstate system. I cannot overemphasize the importance of this study which must be repeated several times in later years. The results are to provide the basis for apportioning future Interstate funds. The first study will provide the formula factor for apportioning the funds for the fiscal years 1960-61 and 62. The manuals for estimating traffic flow volume trends and developing the cost estimates have already been sent to all States. Every effort, including the help of a number of States, was made to set up a procedure that would result in an estimate that could not be questioned as to its validity. George Williams, Assistant Deputy Commissioner for Engineering, is in charge of this study.

The next study is to determine the maximum sizes and weights of vehicles that should be permitted to operate on the Federal-aid highway systems. The ASSHO road test now getting under way in Illinois will provide a major portion of the data required but much additional information as to the frequency and magnitude of axle loads expected on all the Federal-aid systems will be required as well as facts on vehicle costs.

The third study is to provide Congress with information that will aid it in making a determination with respect to reimbursement for highways, both free and toll, which are part of the Interstate system, that were constructed between 1947 and 1957 that "measure up" to the Interstate standards. This study is to include all factors of "cost, depreciation, participation of Federal funds, and any other items relevant thereto." The ground work is being laid for this study and will be initiated soon. Here again your help will be needed.

The fourth study is a most important one and relates to highway safety. In accordance with the terms of the Act it will give consideration to:

(1) the need for Federal assistance to State and local governments in the enforcement of necessary highway safety and speed requirements and the forms such assistance should take;

(2) the advisability and practicability of uniform State and local highway safety and speed laws and what steps should be taken by the Federal Government to promote the adoption of such uniform laws;

(3) possible means of promoting highway safety in the manufacture of the various types of vehicles used on the highways;

(4) educational programs to promote highway safety;

(5) the design and physical characteristics of highways; and

(6) such other matters as it may deem advisable and appropriate.

Charles Prisk, immediate past President of the Institute of Traffic Engineers and head of our Bureau Traffic Control Research Unit, will be in charge of this study.

The fifth, and I believe the most difficult of all the studies, calls for an analysis of the cost of providing highway facilities for different classes of vehicles and of the benefits derived from highway use by all classes of highway users. It also requires an estimate of the benefits of highways to other than highway users. The purpose of the study is to furnish the Congress with a basis for determination of "equitable" rates of taxation on highway users and other beneficiaries. We have been referring to this as the "incremental study." It is without question the most complex study we have ever undertaken and your help will be needed. Mr. G. P. St. Clair, head of our Financial and Administrative Research Branch, has been named project leader.

During the past few years I have traveled by automobile on some portion of the highways in every State in the Union. After a few days' driving even a highway engineer becomes, at least partly, just another motorist. I would like to record a few observations of such a motorist based on these visits.

(Continued on page 181)

Men-Money-Modern Methods

By Henry A. Barnes
(Mem., ITE)
Director of Traffic
City of Baltimore, Md.

RECENTLY A SPEAKER at a noon luncheon club in Baltimore made the statement that only the Perma-Stone Co. and Henry Barnes knew what the future Baltimore would look like. Other comments have been made to the effect that in the last three years, more concrete has been poured in the streets of Baltimore than was put in the Boulder Dam. On top of that, it is "common knowledge" that the Traffic Director is the principal stockholder in several signal companies, sign companies and electronic manufacturing companies; that he practically owns at least two major paint companies and has a corner on the glass bead market. Certainly, if anyone was so fortunate as to own such a diversity of interests and companies, they would not condescend to also be a traffic engineer with all its many abuses.

The main point, however, is that people are at least aware of the fact that things are being done at Baltimore —not in any one section, not for the benefit of any one class of people, but for everyone in the City—and today there is hardly a section of Baltimore that hasn't seen some major change in traffic regulations or control during the past several months.

These changes have not come easily nor have they always been accepted with great enthusiasm by the public. However, it has been amazing how rapidly the public has come to realize that improvements can be made in the traffic system of even an old city, and where three years ago, they resisted any attempt to change conditions, today practically the opposite is true, and everyone is now clamoring for the same improvements in their district as they have seen elsewhere in the City.

Those who are familiar with Baltimore realize more than anyone else what a tremendous transformation of policy this represents. Baltimore is one of the older large cities in the country, and in many ways it is ultra conservative and highly frugal; spending money without too much reservation on parks, boulevards, schools, et cetera, but with almost no money available for the control of traffic. In 1953 a budget of $370,000 was available plus about one-quarter million dollars for the installation of new signals by the specific approval of the Board of Estimates in each case. Of the $370,000, $350,000 was already encumbered to pay for electrical energy and for employees' salaries. That left $20,000 with which to purchase signs and marking materials, plus the operation of motor vehicles and other equipment.

The Construction and Maintenance Shops were so small and outmoded as to be almost useless. The Sign Shop was located in a building 18 feet wide and 75 feet long and two stories high. This particular building was erected 155 years ago as a fire house when they had hand-drawn equipment. The only thing that had been changed in those 155 years was the size of the cockroaches. The Traffic Signal Shop was located under the parking ramp at the rear of the Police Garage. Every time it rained, everything had to be covered up with tarpaulins and the pumps started to keep water out of the stockbins. Construction materials were scattered all over the City in the basements and attics of various Police Buildings, on vacant lots and almost everywhere else that room could be found.

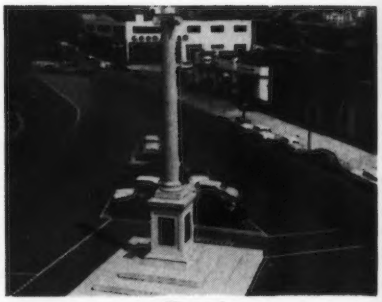

Figure 1
Mount Royal Avenue and Cathedral Street before Channelization.

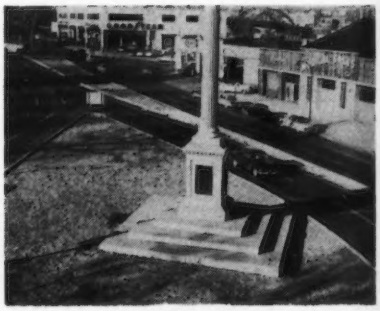

Figure 2
Mount Royal Avenue and Cathedral Street after Channelization.

Motor vehicle equipment, with few exceptions, was worn out, and in fact the investigators were using discarded police cars — the newest of which had at least 170,000 miles on it. These vehicles spent more time in the garage than they did in productive service.

It should be made clear that this is not in any way a criticism of those who were directly concerned with traffic in this City prior to the creation of the new Department of Traffic Engineering because they certainly did everything possible to impress the "powers that be" with the need for money and ade-

Figure 3
Argonne Drive and the Alameda before Channelization and Signal Installation.

Figure 4
Argonne Drive and the Alameda after Channelization and Signal Installation.

quate facilities. Probably, however, it was analogous to the old Greek philosophy that "a prophet is without honor in his own community." Therefore, their pleas for proper facilities were pretty much ignored.

Today quite a different situation exists, primarily due to the interest that Mayor Thomas D'Alesandro, Jr. has personally taken in the problem. When the Department of Traffic Engineering was established in 1953, it was done with the promise that, first, the Department would be vested with authority to accomplish traffic improvements without political interference. The only regulations which required action by City Council were those of one-way streets and general parking restrictions. Anything else, such as signs, signals, markings, loading zones, pedestrians, trucks, etc., could be accomplished by action of the Traffic Director. It was promised that an adequate staff of trained engineers would be made available, that necessary funds with which to operate the Department would be available, and that adequate office and shop space would be acquired. It was understood that the Traffic Director would be left strictly alone "politically" and that as long as a satisfactory job was being accomplished, no interference would be encountered. If a satisfactory job was not being done, those responsible would be discharged and new personnel employed. On the basis of these promises, briefly here is what has been accomplished.

The Traffic Director's budget has been increased to a high in 1955 of $2,100,000, in 1956 approximately $2,000,000. Personnel has increased from 70 in 1953 to a high of 250 during the summer of 1956. Motor vehicle equipment has increased from 23 vehicles in 1953 to 70 vehicles in 1956. Offices have been provided which, even though adequate in 1954, are now much too small and approximately the first of the year, the Department will move to a completely rehabilitated six-story building in the downtown area and will occupy the top two floors, providing about three times present office space. A centrally located Construction and Maintenance Shop has been purchased at the cost of $167,000, containing 28,000 square feet and has been equipped with modern facilities for painting and fabrication of signs, carpenter and machine shop, electrical maintenance and construction, stockroom facilities and parking meter shop, plus administrative offices. In addition, a four-story building immediately adjacent to our Shop has been leased for material storage, and the Department is now in the process of leasing an additional modern building containing approximately 20,000 feet of shop space with 10,000 feet of outside storage space to be used solely for signal construction activities.

Until the early part of 1956, this Department had to rely on radio telephones leased from the Bell System or the Police Department radio for communication. If the Police Department handled a total of 60 calls daily for us, they complained bitterly because we were interfering with Police Department activities. Therefore, a complete two-way radio system (KGD 380) operating on 453 megacycles was leased from Radio Corp. of America. Twenty-five vehicles were equipped with two-way radio plus the main control station located in our Construction Shop and manned 24 hours daily, and in addition a remote control at the office and one at the home of the Traffic Director. This Communications Department has handled as many as 2,800 calls daily, which obviously has tremendously increased the efficiency of departmental operations.

The Shop has been further equipped with the most modern type vehicles such as hydraulic derrick for setting poles and handling heavy loads, electric generator trucks with floodlights

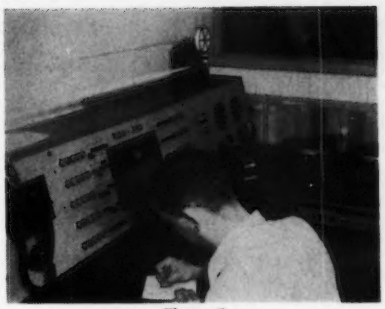

Figure 5
Radio dispatch center.

for nighttime construction or emergency operations, air compressors, multi-line paint machines and many other necessary pieces of equipment.

One of the most interesting devices of the Construction and Maintenance Bureau is the Electrical Maintenance Section which has been equipped with a fully screened room along with all types of equipment for proper maintenance of electronic traffic control devices, including radar as well as actuated and fixed time equipment. This particular division has cost a great many thousands of dollars to establish but has proven well worth the expenditure which is indicated quite clearly in the number of maintenance calls on traffic controllers. All equipment is now put through standard factory recommended testing procedures before it is released for installation in the field.

One of the toughest problems facing the Department in 1953 was that of installing a traffic control system that would adequately regulate traffic on our antiquated street systems. So many problems existed that it soon became apparent no standard type system would anywhere near efficiently do the job. Therefore, nearly a year and one-half of research went into studying the problem. As a result, an entirely new type of signal system was designed and put out on bid to all manufacturers in the signal industry.

This first system will control about 365 intersections, encompassing the entire central and northwestern sections of the City. The plan calls not only for installation of centrally controlled, inter-connected, secondary electronic apparatus, but also the rebuilding of all traffic signal indications within the entire area. Pedestals will be removed and vehicle indications placed on span wire or mast arm mountings. Pedestrian indications will be installed at a 7 ft. mounting height at crosswalks, and in those areas where

Figure 6
New type signal head installations.

Figure 7
New type signal head installations.

serious conflict exists between turning vehicle movements and pedestrians, the all-pedestrian phase will be instituted.

This new system is complex; yet, it is so flexible that automatically, through the process of continually counting traffic and tabulating results at six-minute intervals, the master controller will be able to select any combination of 220 possibilities. This will provide for 3 different splits, 6 cycle lengths, 5 off-sets, pedestrian intervals, all red periods, advance green indications, as well as actuation at all points outside the Central Business District. A total of 460,000 feet of 15 conductor cable had to be installed plus about 75,000 feet of 45 conductor cable.

The first two systems, when completely installed, will cost more than $1,000,000 and would have been in operation sometime this year had delay not been encountered with delivery of secondary control equipment. It is now hoped these systems will be in operation sometime early next spring.

The aforementioned system is the first two of eight to be installed. Another small system of this same type has been in operation about a year, and two other similar systems are now being installed. During the next three years, three additional systems will be installed. The total cost of these projects is estimated at about $4,500,000.

When the Traffic Engineering Department first started installing concrete islands in the center of busy streets, a tremendous howl of protest went up. People couldn't understand why we were putting a concrete island on streets which, in effect, made them narrower than before when we were already screaming the streets were not wide enough. However, after some months of having these islands in operation, we now get requests for additional installations almost weekly.

As a matter of fact, this Department is in the rather enviable position of lacking only one ingredient to make for a perfect operating set-up. We certainly have the authority with which to get things done. We have the money to pay for necessary improvements. We have nearly ample staff with which to carry on the work. Satisfactory shop facilities and equipment are available. New, adequate, office space will soon be available. We have complete freedom from political and other such pressures and interferences. Therefore, one might wonder what in the world else you could need to make things perfect. The one ingredient lacking is a 48-hour work day!

Since the public has become aware that it is possible to make major improvements, even with our antiquated street system, the clamor for such improvements from all sections of the City is practically deafening. Everyone wants permanent crosswalk markings, pedestrian islands, and stop signs. Everybody wants parking meters and new traffic lights.

Even with the force we now have, we still can nowhere near keep up with the demand for these improvements.

Actually signal crews are working 16 hours a day on installations. Yet, we have requests for more than 600 signals at the present time. More than 5,000 stop signs have been installed in the past three years, but we are still getting requests every day for additional such signs. (As a matter of fact, if many more stop signs are placed in Baltimore—we will probably have the only system of stationary traffic in the country.)

While Baltimore does not, in any way, set itself up as a personification of what is proper in the way of traffic engineering — because Baltimore is only one city and has many problems unique only to Baltimore while other cities must similarly approach their problem more on a local than general basis — still, it does seem that this experiment can well serve as an indication of what almost any city can do about its traffic problems if those responsible are willing to take the necessary steps. A Department with proper authority, staff and finances left alone to do the job properly *cannot fail.*

Figure 8
Channelization and medians with left turn slots on North Avenue.

Figure 9
Channelization and medians with left turn slots on North Avenue.

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Four Headlamps For Better Seeing

By Val J. Roper

Illuminating Engineer

General Electric Company

INCREASED SEEING DISTANCES are provided by the "dual unit" sealed beam system installed on some 1957 model passenger cars. A pair of units on each side of the car functions *together* to form the upper or clear road driving beam, and one of the pair provides the lower or passing beam. General use of this system on 1958 model passenger cars is anticipated.

Figure 1
Test car used in early 1920's to establish desirable headlamp beam patterns.

Figure 2
Test car driven by observers to measure seeing distances.

While the average motorist is very aware of the glare provided by approaching headlamps, he does not always appreciate the limitations in seeing distances—even with the improved sealed beam headlamps used on the 1956 car models. An appreciation of the need for the improvement offered by the new "dual unit" system can be gained from a study of available data in headlamp performance.

Controlled seeing distance tests by observer-drivers have helped to establish fundamental relationships between such items as beam candlepower and seeing distance, the interference of glare, the visibility of obstacles of different reflection factors (that is, from light to dark), and the effect of speed upon the ability to see.

Figure 3 shows the relation between seeing distance and beam candlepower in thousands, for obstacles of different reflection factors. The lower curve is for a dark-colored obstacle with a reflection factor of only 3%. You will note that with 75,000 beam candlepower, on a clear road with no other cars approaching, this dark-colored obstacle can be seen at about 260 feet, for a speed of 50 miles per hour. This

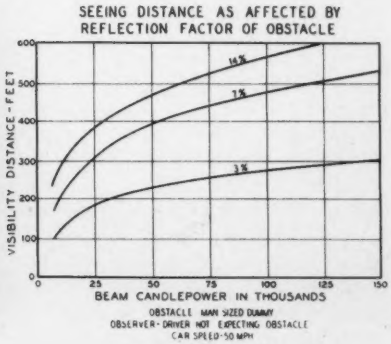


Figure 3

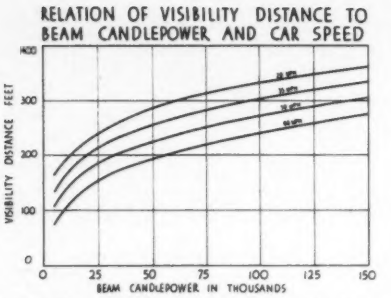

RELATION OF VISIBILITY DISTANCE TO
BEAM CANDLEPOWER AND CAR SPEED
VISIBILITY DISTANCE FEET
BEAM CANDLEPOWER IN THOUSANDS
OBSTACLE. MAN SIZED DUMMY IN DARK CLOTHING OBSERVER DRIVER NOT EXPECTING OBSTACLE
CANDLEPOWER DATA THOSE FOR DRIVER NOT EXPECTING OBSTACLE COMBINED WITH AVERAGES
ALL OBSERVERS AWARE OF TEST - 50% FACTOR APPLIED SPEED DATA: AVG 13 OBSERVERS
20 FT DECREASE FOR EACH 10 MPH INCREASE

Figure 4

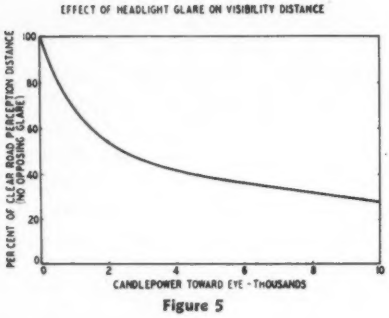

EFFECT OF HEADLIGHT GLARE ON VISIBILITY DISTANCE
PER CENT OF CLEAR ROAD PERCEPTION DISTANCE (NO OPPOSING GLARE)
CANDLEPOWER TOWARD EYE - THOUSANDS

Figure 5

illustrates very well why anyone walking on the highway at night should wear something light in color. With 14% reflection factor, which is fairly light, the obstacle can be seen at around 520 feet, with 75,000 beam candlepower.

Figure 4 shows the effect of speed on our seeing distance. Unfortunately, the faster you drive, the less far you can see. The reason is that it takes time to see, and at the higher speeds there is less time available to scan each part of the road. The obstacle in this case is a pedestrian in dark clothing. The 50-mile-per-hour curve is the same as that shown on the previous chart. We actually lose 2 feet in seeing distance for every mile per hour increase in speed, or conversely gain 2 feet for every mile per hour decrease in speed.

Figure 5 shows the effect of glare upon seeing distance for a critical situation. The obstacle, a dummy in dark clothing, was placed behind a stationary opposing car and at a lateral distance of 10 feet to the right of its headlamps. The observer approached from a distance of about 1/3 of a mile. 1,000 candlepower from the opposing headlamps, which is what the lower beam, properly aimed, provides toward the eyes of the approaching driver, reduces the seeing distance by about 1/3. 7,000 candlepower reduces it 2/3, and then the curve flattens out — that is, additional increments in glare candlepower have a lesser percentage effect.

Studies such as these were very instrumental in establishing the need for the 50% increase in light output which was realized with the introduction of the sealed beam lamp in 1939.

With this outstanding development, standardization of headlamp performance was achieved, as well as standardization of the physical dimensions of headlamps. A single sealed beam headlamp design replaced a wide variety of shapes, sizes and types, and thus facilitated service as well as provided improved performance.

Along about 1950, some state administrative authorities and also some engineers began to wonder if the original design favored the upper beam more than it should.

When two beams are provided by a single optical device, compromises have to be made in one or both. Since the war, the number of vehicles on the road has increased to the extent that the average motorist now spends more and more of his night driving time on the lower beam. And the available seeing distance data obtained with observer-drivers certainly indicated the need for improvement in the results with the lower beam. In 1952, state motor vehicle authorities asked the car manufacturers for an improvement in the lower beam, even if at the expense of upper beam performance.

For such product design activity, laboratory test head assemblies such as illustrated in Figure 6 are used to project experimental beams on a charted screen such as illustrated in Figure 7. The horizontal and vertical lines on the screen are one degree apart. The horizontal line across the center of the screen represents the height of the headlamp centers from the ground. The vertical line through the center of the screen is straight ahead of the lamp. The intersection of these two lines is called the "H-V" point.

Figure 8 shows superimposed on the screen a picture of a two-lane road with an approaching vehicle 100 feet away. On a two-lane straight level road, the average driver's eye is about ½ degree above the horizontal and

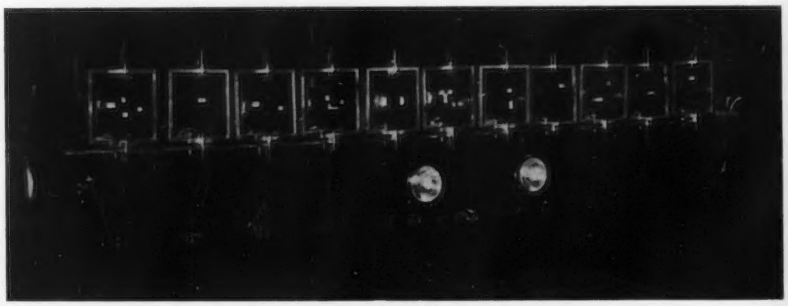


Figure 6
Test rack for designing headlamp lenses.

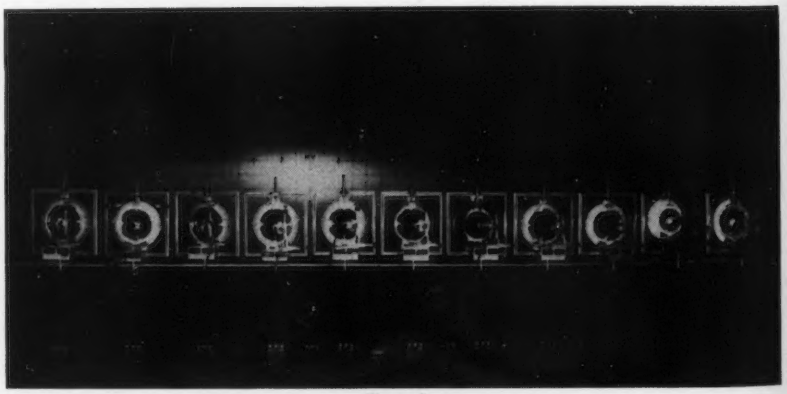


Figure 7
Composite beam pattern projected on laboratory screen.

about 3½ degrees left of the vertical when the approaching car is 100 feet away.

Farther away, the approaching driver's eye recedes toward the H-V point. On a two-lane road, for all practical purposes it can be considered that the approaching driver's eye is at the H-V point when he is 1,000 feet or more away. This picture illustrates why it is so necessary to limit the glare near a line extending from the H-V point through the point ½ degree up and 3½ left, for the most critical condition of meeting other cars on a two-lane road. Of course, on divided highways this situation is less critical.

Figure 9 has superimposed upon the screen and picture, the upper beam of a *single* 7" sealed beam headlamp. There is a high intensity zone for distance seeing, light to the sides for seeing around curves before you get to them, light well above the horizontal to permit seeing ahead on rolling roads, and a graded intensity below the hoirzontal and to the sides to evenly light the road surface back to the car, and the road shoulders nearby.

Figure 10 shows the lower beam from one present sealed beam headlamp superimposed upon the screen and the road picture.

If we attempt to improve the seeing with this lower beam, both beams must be modified since they both utilize the same optical system.

Without a lens in place, the resulting beam is much the same as that of a spotlight. To obtain a second beam which deflects downward and to the right, a second filament is placed above and to the left of the first filament. By turning off the first filament and lighting the second, most of the light is shifted downward or to the right, but some is not. Hence it becomes necessary to analyze the lens and reflector area one section at a time, building the high intensity portion of the upper beam only from those sections of the lens and reflector which will also benefit the high intensity portion of the lower beam. Any areas not conforming with these requirements must be used in the remainder of the beam pattern.

As each lens section is analyzed, the decision is made on how to best treat the light in that section. For instance, spreading lens elements are used to spread the light far across the road for seeing around curves or to spread it only a few degrees for distant illumination. Prism elements are employed to bend the light up, down or to the side as desired. The decisions are recorded, section by section, for the entire lens area and trial tooling is prepared from which sample glassware is pressed.

It is evident in this procedure that the usefulness of each lens section is dependent upon its effect on both beams. Compromises result which are inherent in multiple-beam headlamps, and it is from this area of compromise

Figure 8
Two-lane road picture projected on laboratory screen.

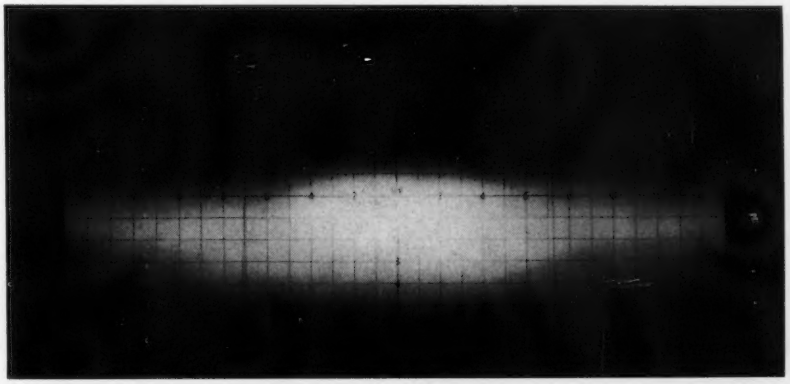


Figure 9
Upper beam of single 7" diameter sealed beam headlamp.

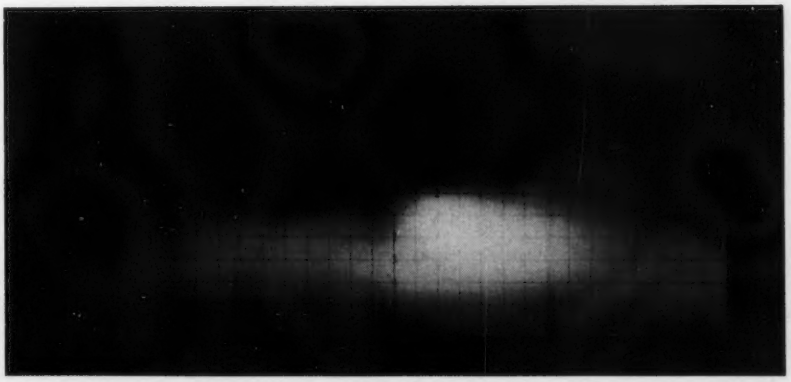


Figure 10
Lower beam of single 7" diameter single beam headlamp.

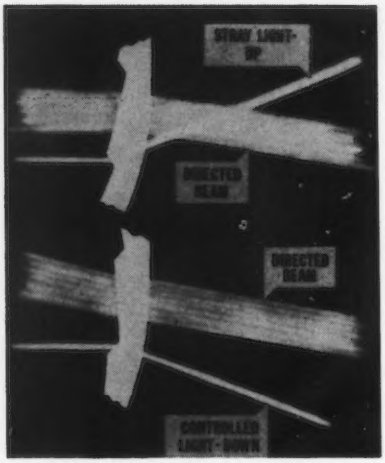


Figure 11
Change in stray light direction from lens of improved sealed beam headlamp.

that the improved lower beam of the 1956 model sealed beam headlamp was derived. Emphasis in design was shifted to favor the lower beam. The resulting sacrifice in the upper beam was compensated for by an increase in wattage from 45 to 50.

Also, additional features were included in the product to improve seeing during adverse weather. To make a lamp better for use in fog, snow, and heavy rain it is necessary to reduce, insofar as possible, the upward stray light. Some of this upward stray light comes from direct filament rays which do not strike the reflector but emerge from the front of the lamp. This stray light illuminates the particles in the driver's line of vision, making it difficult to see the road beyond. A small metal shield in the improved sealed beam lamp blocks much of this direct filament light without affecting the main beam.

Stray light is also developed at the divisions between rows of lens elements. Figure 11 shows enlarged cross-sectional views of light from the reflector passing through the lens elements. In the former design (at the top), the principal rays pass through the lens to the road, but some light striking the divisions between rows is refracted upward. Tilting the axis of the reflector down permitted designing the lens so that the rays striking the divisions are refracted downward to the road surface (bottom illustration).

The improved sealed beam headlamp does indeed give considerably better seeing results in fog. While it does not permit driving at normal speeds in fog, the improved lower beam with less stray light above the horizontal does disclose the road and obstacles on the road nearby better than in the case of the former sealed beam headlamp.

However, since both upper and lower beams are provided by the same optical system, we still can't provide optimum results with both.

In a technical paper presented to the Illuminating Engineering Society in 1933, General Electric engineers cited the deficiencies due to compromise in multiple-beam headlamps. They recommended separate lamps for upper and lower beams, and demonstrated that with these separate lamps, each could be designed for optimum performance. This approach was also utilized a few years later when the first sealed beam headlighting system was presented for industry consideration. Four single-filament lamps, 2 for the upper beam and 2 for the lower beam, were installed on demonstration cars for this purpose. Figure 12 shows a 1938 Lincoln Zephyr so equipped.

Car engineers rejected this system in 1938 partly because of the aiming problem,—the problem of aiming four lamps instead of two, with two of the four more difficult to aim because of the asymmetrical beam pattern.

Another deterrent to adoption at that time was expressed by the stylists. They then felt that they could not make an attractive-looking front end with four units. It is therefore interesting to note that it was the stylists who were most active in stimulating the present move for adoption of the four-headlamp system.

The individual units of this dual-unit system are of the same diameter as those proposed in 1937, but there are some notable differences and improvements over the earlier proposal.

Although they are all designed as single-filament lamps, as indicated in Figure 13, two have single filaments and two have two filaments. One single-filament lamp and one 2-filament lamp are used as a pair on each side of the car. Each single-filament unit is designed for the upper beam only (Figure 14), and projects light far ahead for distant seeing. But to take full advantage of the potential, a second, off-focus filament in each of the other lamps is also lighted (Figure 15). This provides additional light above and around the main beam, which drivers will appreciate on the

Figure 12
Early "four lamp system" installed on demonstration car.

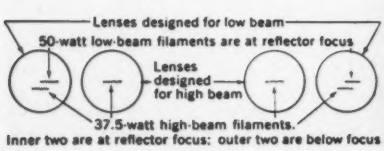

Lenses designed for low beam
50-watt low-beam filaments are at reflector focus
Lenses designed for high beam
37.5-watt high-beam filaments.
Inner two are at reflector focus; outer two are below focus

Figure 13
Filament arrangement of dual-unit system.

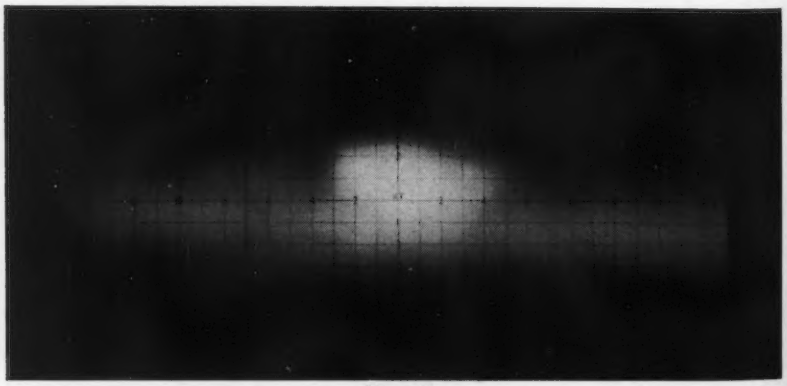


Figure 14
Upper beam from single filament unit.

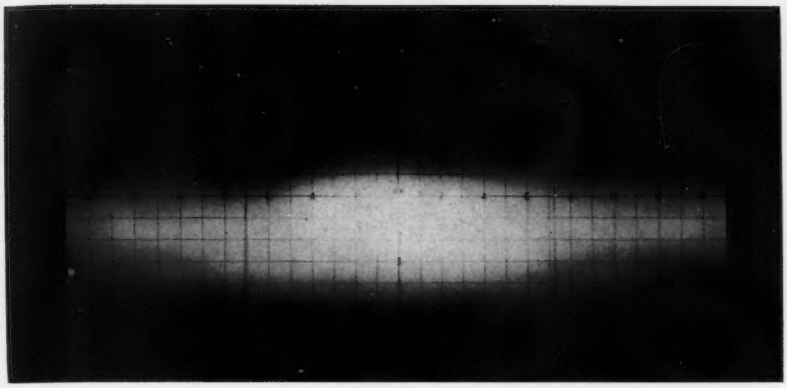


Figure 15

Upper beam portion from second filament of 2-filament unit.

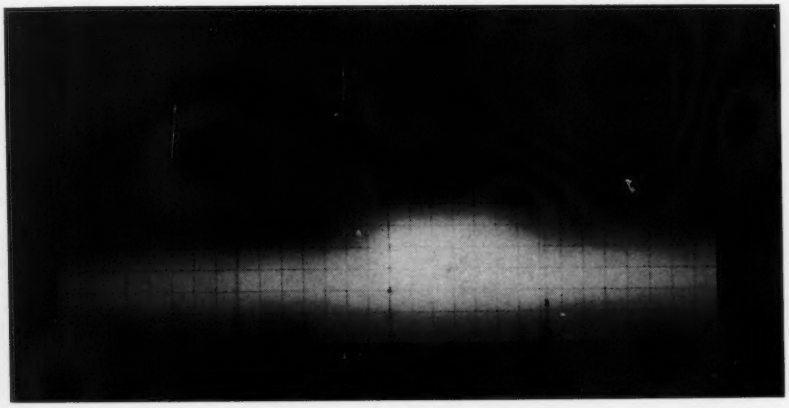


Figure 16

Lower beam from "in-focus" filament of a 2-filament unit.

open road. Greater spread of light in the high intensity zone will help to disclose obstacles at greater distances. Each of the four lighted filaments is rated at 37.5 watts for a total of 150 watts as compared with the present 100 watts.

Each of the 2-filament lamps is designed as though it were a single-filament lamp for the lower beam use only, and the 50-watt on-focus filament provides a lower beam shown in Figure 16. It has a sharper cut-off at the top of the beam, and provides more light farther ahead along the right side of the road for improved seeing distances when meeting other cars.

When driving on the lower beam, only two lamps are used. On the upper beam all four are lighted. Enforcement authorities can more readily determine whether the correct beam is in use.

In years past, car engineers have correctly objected to one aspect of separate lower beam lamps. Because this beam is non-symmetrical, only a trained expert is capable of doing an acceptable job of aiming by conventional means. This would present a serious service problem.

To get the utmost in seeing distance and also to provide adequate glare relief, it is necessary that any headlamp be aimed exactly right. One of the chief reasons why many drivers are troubled by glare is the fact that the approaching headlamps as well as your own, are mis-aimed. But what is even more serious is the fact that seeing distances are greatly reduced by virtue of this mis-aim.

In the past, headlamps have been aimed by means of an aiming screen at 25 feet, in a darkened area. But it is very necessary that the car be aligned precisely with respect to the screen, and all too few service people take the trouble to make this exact alignment.

Also, optical devices have been available which take up much less space and do not require a darkened area. However, these are relatively expensive, and therefore their use has been limited. But they can do a good job, if aligned accurately with respect to the car.

A recent development offers much hope for widespread use of accurate aiming service. For several years, there have been simple mechanical aimers on the market which seat against the headlamp and aim by means of a bubble level. However, in the past this method was not considered sufficiently accurate because they seated on the front surface of the lens, which is not always accurately aligned with respect to the beam.

Recently, manufacturers of sealed beam headlamps have added accurate aiming pads to the front surface of the lens. Duing the process of manufacturing and assembling the lamp, the front surfaces of these pads are accurately aligned with respect to the aim of the beam. Several manufacturers of aiming devices have produced simple mechanical aimers designed to seat against these three pads. These devices are relatively inexpensive and therefore are within the reach of any garage or service station.

With this development, one of the major objections of the car industry to the four-headlamp system—that of the difficulty of aiming an asymmetrical beam—was answered. Each unit of the four-lamp system will be equipped with the three aiming pads. And, fortunately, inexpensive adaptors are available to make it feasible to aim the smaller units of the dual-unit system with the mechanical aimers that have already been sold for use with the present larger lamps.

The importance of exact aim of any headlamps, old or new, cannot be overemphasized. Almost anyone can make a considerable improvement in nighttime seeing by arranging to have his present headlamp aim checked by someone who really knows how. The average motorist can usually double the light directed toward obstacles ahead within his stopping distance by having his headlamps aimed exactly right and at the same time insure that his lower beam does not provide serious glare to approaching drivers.

The Effect of Speed Limit Signs

By Robert R. Coleman
(Assoc. Mem., ITE)
Traffic Engineer, Pennsylvania
Department of Highways

THIS REPORT OF SPEED SURVEYS in Pennsylvania is divided into two parts. The first part consists of "before" and "after" studies at two locations where 35 mile speed restrictions were established. Speeds were checked prior to the installation of 35 mile signs and again after the signs were erected. The purpose of both of these "before" and "after" studies was to determine the effectiveness of reduced speed zones.

The second part of this report is a summary of the results of extensive speed surveys on a twenty-mile section of a major highway in Pennsylvania. A series of checks were made in 1950 at selected locations and again in 1955 at the same locations. The purpose of this study was to determine the change in the speed characteristics of traffic over a number of years taking into consideration any changes in volumes, highway and roadside conditions and traffic control devices.

Part I

The first "before" and "after" study was made on Pa.T.R. 145 which is the main artery entering Allentown from the North. This is a four-lane highway (not divided) varying in width from 44′ to 48′. The shoulders vary from 6′ to 11′. The sight distance is unlimited and the area adjacent to the highway is built-up with service stations, ice cream drive-ins, restaurants, etc. The average daily traffic equals 8500 vehicles. A total of 2313 vehicles was checked during six one hour check periods. The following data should be noted:

	Before Erection of Signs	After Erection of Signs
Vehicles travelling 35 MPH or less	22%	46%
85 percentile speed	45 MPH	40 MPH
Vehicles in pace	58% (37-46 MPH)	71% (31-40 MPH)
Vehicles above pace	16%	18%
Vehicles below pace	25%	10%
Heavy trucks exceeding 35 MPH	73%	56%
Light trucks exceeding 35 MPH	70%	59%
Cars exceeding 35 MPH	79%	51%
Heavy trucks exceeding 50 MPH	5%	0
Light trucks exceeding 50 MPH	0	0
Cars exceeding 50 MPH	0	1%

Chart 1

First Speed Check—December 3, 1953
35 Mile Signs Erected—May 3, 1954
Second Speed Check—May 20, 1954
Third Speed Check—July 8, 1954

Chart 1 above shows the comparison between the "before" and "after" speed data.

This chart shows that 22% of the total traffic was travelling less than 35 miles before the signs were erected as compared to 46% after the signs were erected. Although 54% is still exceeding 35 miles per hour, it is noted that the 85 percentile speed after the erection of signs is 40 miles per hour which means only 15% of the traffic was exceeding 40 miles per hour. The pace dropped from a 37-46 mile per hour range to 31-40 mile per hour range. The number of vehicles in the pace increased from 58% to 71% which is desirable. It was noted that passenger cars observed the 35 mile speed limit more closely than commercial vehicles. It was concluded that this zone can be considered fairly effective and has noticeably changed the speed of traffic flow at this location. The extent of enforcement by local police is not known.

	Before Erection of Signs	After Erection of Signs
Vehicles travelling 35 MPH or less	13%	39%
85 percentile speed	49 MPH	42 MPH
Vehicles in pace	59% (40-49 MPH)	64% (34-43 MPH)
Vehicles above pace	19%	24%
Vehicles below pace	23%	12%
Heavy trucks exceeding 35 MPH	75%	51%
Light trucks exceeding 35 MPH	91%	42%
Cars exceeding 35 MPH	91%	67%
Heavy trucks exceeding 50 MPH	9%	2%
Light trucks exceeding 50 MPH	12%	0
Cars exceeding 50 MPH	24%	5%

Chart 2

This paper was originally prepared for presentation to the Committee on Traffic Control Devices of the Highway Research Board at its January, 1956 meeting.

The second "before" and "after" study was made on U.S. 22 a few miles west of Allentown. U.S. 22 is a four-lane divided highway at this location with 12′ shoulders. Both sides of this highway are built-up with motels, restaurants and service stations. Average daily traffic equals 10,000 vehicles. The following data should be noted:

First Speed Check—March 14, 1955
35 Mile Signs Erected—Mar. 17, 1955
Second Speed Check—April 26, 1955
Third Speed Check—May 24, 1955

On the preceding page Chart 2 shows the comparison between the "before" and "after" speed data.

In this chart it is noted that the 85 percentile speed was reduced from 49 to 42 miles per hour. The vehicles trevelling at 35 miles or less increased from 13% to 39%. The vehicles in pace increased from 59% to 64%. Although the number of heavy trucks exceeding the speed limit was reduced 25% and the number of cars 35%, the majority of vehicles still exceed the posted speed limit. This speed zone has a marked effect on the traffic flow at this location; however, it could hardly be called an "effective" speed zone because 60% of vehicles still exceed 35 miles per hour.

The establishment of this speed zone received considerable local publicity but the extent of enforcement is not known.

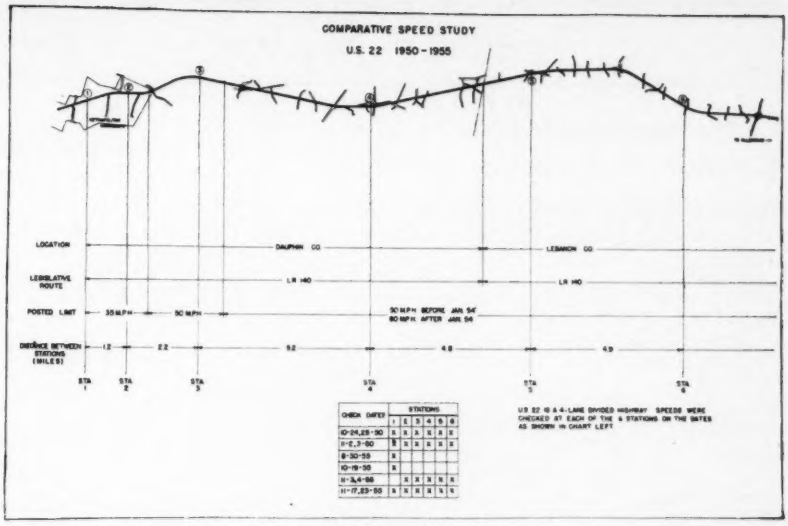


Figure 1

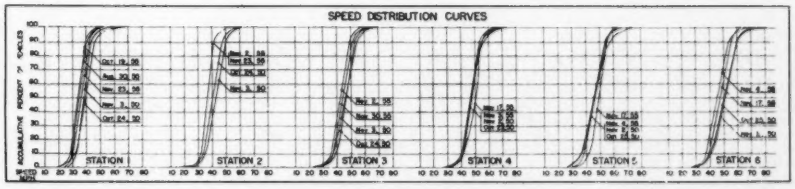


Figure 2

Part II

The second portion of this report concerns a speed study made on U.S. 22 just east of Harrisburg in Dauphin and Lebanon Counties. U.S. 22 is a major east-west artery through Pennsylvania. The test section, which is approximately 20 miles long, is a four-lane divided highway. Six (6) locations were selected for checking speeds as shown on Figure 1.

Stations 1 and 2 are located on the outskirts of Harrisburg where the speed limit is posted for 35 miles per hour. This section of the highway is closely built-up on both sides with residences, gas stations, restaurants, etc. It is a typical fringe area of a medium-sized city. Stations 3, 4, 5 and 6 are located in rural areas. The posted speed limit was 50 miles per hour during the first series of checks in 1950, but was later changed to 60 miles per hour prior to the 1955 series of checks.

A total of twenty-five (25) one hour checks were made at the six stations during which time speeds of over 9200 vehicles were recorded. The traffic was free-flowing at all locations and all checks were made under clear and dry highway conditions. The average daily traffic is approximately 14,000 vehicles at stations 1 and 2 and 5300 vehicles at stations 3, 4, 5 and 6.

Traffic controls in 1950 were similar to those in 1955 with these exceptions. At stations 1 and 2 the existing 35 mile speed signs were replaced with new and larger signs just prior to the 1955 series of checks. At stations 3, 4, 5 and 6 the speed limit was raised from 50 to 60 miles per hour. The 60 mile signs were spaced at two mile intervals, while the 50 mile signs had been spaced at five mile intervals.

Shown next are a number of curves which indicate the speed characteristics at each of the six locations. The speed distribution curves (Fig. 2) at station 1 indicated that the 1955 speeds averaged 5 miles per hour slower than the 1950 speeds. The 85 percentile speed was 44 miles per hour in 1950 and 39 miles per hour in 1955. At station 2 the 1955 speeds averaged 5 miles per hour slower than 1950. The 85 percentile speed dropped from 48 miles to 41 miles per hour. At station 3 the 1955 speeds averaged 3 miles per hour slower than the 1950 speeds even though the maximum limit was raised from 50 to 60 miles per hour. The 85 percentile speed was 53 miles per hour in 1950 and 50 miles per hour in 1955. At station 4 the 1955 speeds averaged 2 miles per hour faster than the 1950 speeds. However, the 85 percentile speed was 54 miles per hour for both periods. At station 5 speeds during both periods were about equal except for the November 17, 1955 check which showed traffic moving 5 miles per hour faster in the lower speed ranges and about 3 miles per hour faster in the upper speed ranges. The 85 percentile speed averaged about 55 miles per hour for all vehicles. At station 6 the 1955 speeds were 3 to 4 miles per hour slower than the 1950 speeds. The 85 percentile speed was 54 miles per hour in 1955 and 59 miles per hour in 1950.

Curve 2 shows that the percentage of vehicles in the pace increased at all six stations. At stations 1 and 2 in the 35 mile zone the increase averaged 10% to 15% and at stations 3, 4, 5 and 6 the increase averaged from 2%

(Continued on page 185)

Traffic News

Traffic Engineering Seminar in Evanston March 4-22

The Midwest Section and members of ITE will cooperate with the Traffic Institute of Northwestern University in a three-week Traffic Engineering Seminar in Evanston, Illinois, from March 4 to 22.

This is a unit program designed for traffic engineers and others with engineering backgrounds now working in areas of activity closely related to traffic engineering.

Presentation covers field study methods, the interpretations and presentation of data; traffic engineering regulation and control; devices and techniques for getting maximum utility from existing street systems.

Functional roadway and traffic facility design, relationships between city planning and traffic planning and suggestions for developing comprehensive urban traffic plans are included.

Each registrant receives specially prepared monographs on selected traffic engineering functions, as a supplement to the Seminar instructional presentation.

Tuition is $165.

Chicago Transportation Study Reports Progress in First Year

The Chicago Area Transportation Study reports that in its first year it has completed the mass collection of data.

In a detailed progress report, Study Director J. Douglas Carroll, Jr., offers the following figures:

1. As of November 9, 57,000 dwelling places have been contacted and a complete travel history for one day recorded for each of these places. This survey has developed over 300,000 trip records of individual travel within the metropolitan area. This information is presently being translated into numbers, punched into cards, and prepared for rapid analysis.

2. A survey of commercial vehicles is completed. This survey recorded a complete daily travel history for 8,656 trucks and taxis. In all, approximately 55,000 vehicular trips have been detailed and recorded.

3. Special field surveys were made on roadsides and over 200,000 drivers were stopped and travel data collected.

4. A small survey covering all railroad commuters, who traveled into the metropolitan area from a distance of more than 30 miles out, was taken at the late summer, and the replies of these travelers are being coded and prepared for analysis.

While it will be some time before summary figures of Study findings will be available, at this point there are some items of interest:

1. In Chicago there is much greater transfer of riders between different forms of travel than has been reported in any other city in the nation with the possible exception of New York City. That is, people use cars and railroads or buses combined with subways to complete a trip to a much greater degree than has been recorded elsewhere.

2. The distribution of trips according to the purpose of the trips for Chicago residents is very similar to the arrangement of travel purposes in other cities. That is, the extent to which people travel to work, to shop, for social recreation purposes, or for personal business, is about the same in the Chicago area as in all other major metropolitan areas for which data are available. Work is the most frequently mentioned trip purpose, followed by social or recreational trips, then shopping trips, and finally, trips to transact personal business.

3. On the average, the people in a Chicago area household make fewer trips in a day than in most other metropolitan areas. Because of the very high-density land development in Chicago, people are able to walk between different land uses in the Loop or near their homes to obtain things which otherwise would require a vehicular trip. Use of the motor car is much less common in Chicago than in smaller metropolitan areas. Conversely, there is a much greater use made of public transportation facilities.

for HIGHWAY ENGINEERS only...

D. O. OPSTAD,
General Sales Manager,
Reflective Products Division, Minnesota Mining & Mfg. Co., St. Paul 6, Minnesota.

Traffic signs of "Scotchlite" Sheeting reflect not only a 24-hour-a-day message, but also they reflect your concern for safety in a way that motorists of your area can easily see.

It's a strange thing, but all the planning, patience and work that goes into a new highway sub-surface or draining system isn't appreciated to the full extent by the public. Obviously, because they are not engineers, they just don't know about it. But they do see traffic signs . . . and the better the sign, the more favorable their impression of the road as a whole. The dramatic, simple sign tells a lot about your work.

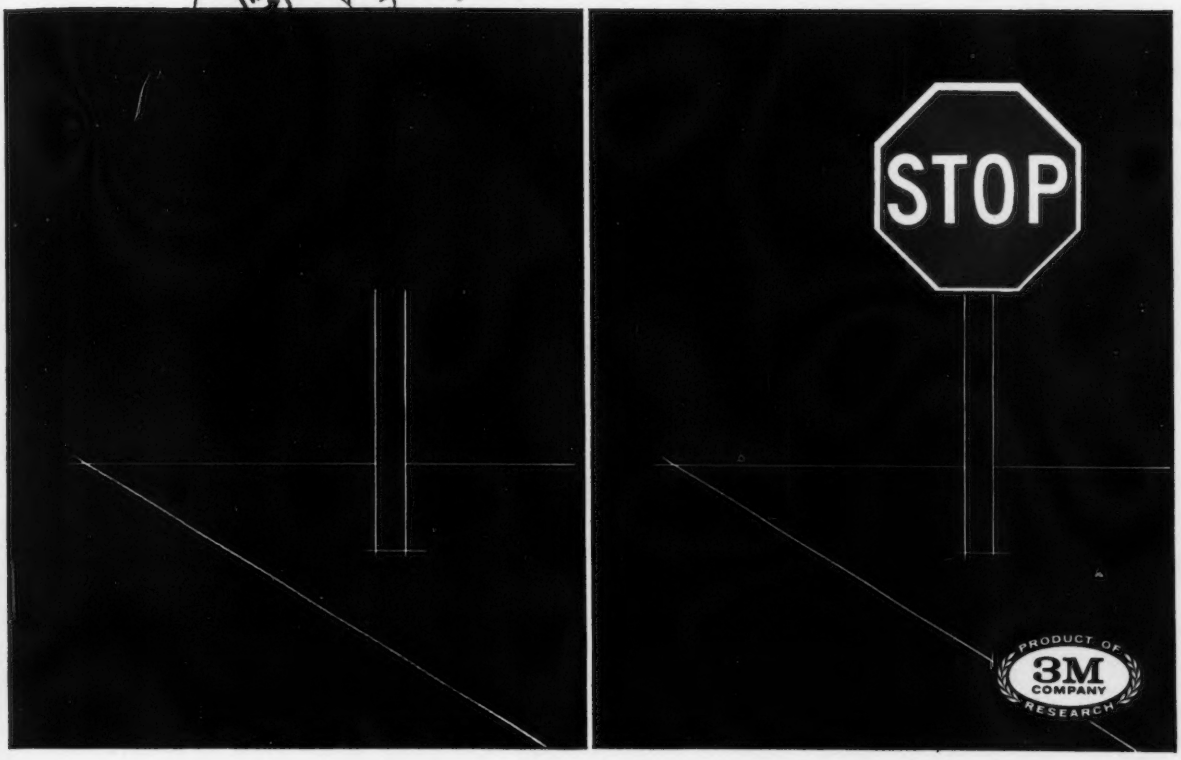
And no other traffic sign shows your message of safety so dramatically, so surely, as a sign of "Scotchlite" Sheeting. The advertisement on the right—appearing in the Jan. 25 issue of U.S. News & World Report magazine—shows you what we mean.

D. O. Opstad

NOTES:

We hope to see you at the ARBA Road Show in Chicago, Jan. 28-Feb. 2 at the International Amphitheatre. Stop in at our exhibit on "The Oregon Trail".

Safety in traffic signing keeps pace with progress



Signs you can't see can kill you!

Both of these signs were installed to protect you. *But only one does a full time job.*

Only the one on the right meets today's requirements for effective signing laid down by safety-conscious traffic engineers. Made of "Scotchlite" Reflective Sheeting, it shows up just as brightly at night as by day. It reflects your headlights with glareless brilliance. You see the *entire* sign—its identifying shape and color even before you can read the message.

Ordinary signs hide in the dark. Signs of "Scotchlite" Reflective Sheeting get your attention at any hour, in any weather. With ⅔ of all traffic fatalities occurring at night . . . which sign would *you* rather have guarding you?

You *can* have them . . . and *now!* Write to your mayor or governor or highway commissioner. Tell him you want traffic signs that are always on the job. Your letter will help get for your community the modern signs you can *see* both day and night . . . signs of all-weather, durable "Scotchlite" Reflective Sheeting.

WIDE ANGLE FLAT-TOP®

REG. U. S. PAT. OFF.

SCOTCHLITE

BRAND

REFLECTIVE SHEETING

3M

The terms "Scotchlite" and "Flat-Top" are registered trademarks of Minnesota Mining & Mfg. Co., St. Paul 6, Minn. Gen. Export: 99 Park Ave., New York 16, N. Y. In Canada: P. O. Box 757, London, Ont.

TURN TO PAGE 000 FOR IMPORTANT INFORMATION ON THIS NEW SAFETY CAMPAIGN

Nevada uses traffic signs of "Scotchlite" Reflective Sheeting for safety day and night.

"Our traffic regulates itself through new CROUSE-HINDS Time Cycle Control System"

—Mr. H. J. Hoose, Traffic Engineer, Charlotte, N. C.

"Five years ago we installed a variable-time cycle Trafflex control system that relieved much of our downtown congestion. But we still found such unpredictable volumes during peak periods that the programmed cycle changes couldn't keep pace.

"It took Crouse-Hinds new Time Cycle Control by Traffic Density to eliminate Charlotte's traffic headaches. Now, by using Crouse-Hinds' new Traffic Density Master Controller in conjunction with our Trafflex Control System — *the flow of traffic controls the time cycle . . . automatically and instantaneously.*

"Detectors placed at strategic points transmit traffic volume to the Master Controller, which evaluates the density and immediately makes necessary changes in the time cycle to relieve congestion. This has resulted in less accumulation of traffic at intersections and less traffic build-up prior to peak periods. In short, we have found that Crouse-Hinds' Time Cycle Control by Traffic Density permits our system to operate at *maximum efficiency at all times.*"

The ideal solution to your traffic problem may be Crouse-Hinds Trafflex Control System with new Traffic Density Master Controller. Present users of Trafflex systems may add this new accessory to existing facilities. Write for full details.

A NATIONWIDE DISTRIBUTION exclusively through ELECTRICAL DISTRIBUTORS

CROUSE-HINDS COMPANY

Main Office and Factory: Syracuse, N. Y.
Crouse-Hinds Company of Canada, Ltd.: Toronto, Ont.

OFFICES: Birmingham Boston Buffalo Chicago Cincinnati Cleveland Corpus Christi Dallas Denver Detroit Houston Indianapolis Kansas City Los Angeles Milwaukee New Orleans New York Philadelphia Pittsburgh Portland, Ore. St. Louis St. Paul San Francisco Seattle Tulsa Washington RESIDENT REPRESENTATIVES: Albany Atlanta Baltimore Baton Rouge Charlotte Chattanooga Jacksonville Reading, Pa. Richmond, Va. Shreveport

HIGHWAY PROGRAM

(Continued from page 167)

First let me say that I think the State highway maintenance organizations are doing a magnificent job but that some of our obsolete highways, particularly the narrow pavements, present them with an almost impossible task.

The widening and resurfacing which has formed so large a part of the States' postwar program is one of the most satisfactory and pleasing of your operations!

While more attention is being paid to marking detours and to facilitating the movement of traffic through construction operations, there is a noticeable lack of uniformity in the type, shape, size and color of such markings. A few highway departments give out cards explaining the work underway and requesting patience. This has a good psychological effect.

Informational signs are not uniform and often leave much to be desired. Letters are sometimes too small to be read quickly at present legal speeds. Overhead signs are coming into greater use and are very helpful. New standards for informational signs are needed for our expressways and particularly on the Interstate system. Signs well in advance of an approach to an interchange are necessary. They should be repeated and give the motorist information as to intersecting routes, services, motels, etc.

Portable "MEN WORKING" signs have a very useful function but too often after slowing down a motorist will find that the workers have disappeared.

Signs giving the names of rivers and towns are pleasing to the stranger.

I also noted in my travels on these new turnpikes a different approach to highway maintenance. More emphasis was placed on furnishing a transportation service. Interference with the motorist during maintenance operations was kept to a minimum and the safety of both the highway user and the maintenance employee was given great consideration. Under controlled access conditions, many services such as towing, ambulance, fire protection, etc., were provided not only as a service to the motorist but also as a necessary adjunct to the safe and economic use of the facility.

If the drive-in movie industry does not police itself, licensing should be required to prevent screens directly open to the highway. While many are properly placed, I have noticed with growing concern an increasing number with screens so placed as to tempt the night driver and thus constitute a safety hazard.

Passage of the 1956 Act is both a fulfillment and a beginning. The Congress has indicated confidence in the ability of the State highway departments and the Bureau of Public Roads to carry out the assignment. The future economic progress of our country depends in no small measure on the success of this program. We must not fail.

Coming Events

January 7-11—HIGHWAY RESEARCH BOARD—
Annual Meeting, Sheraton-Park Hotel, Washington, D. C. Contact: HRB, 2101 Constitution Ave., Washington 25, D. C.

January 21-25 — AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS—
Winter General Meeting, Hotel Statler, New York, N. Y. Contact: AIEE, 33 W. 39th St., N. Y. 18, N. Y.

January 28-February 2 — AMERICAN ROAD BUILDERS ASSOCIATION—
Annual Convention and Road Show, Chicago Amphitheatre, Chicago, Ill. Contact: ARBA, World Center Bldg., Washington 6, D. C.

February 18-22—AMERICAN SOCIETY OF CIVIL ENGINEERS—
Convention, Hotel Heidelberg, Jackson, Miss. Contact: ASCE, 33 W. 39th St., New York 18, N. Y.

February 28 - March 1 — ILLINOIS TRAFFIC ENGINEERING CONFERENCE—
9th Annual Conference, Contact: John E. Baerwald, 401 C. E. Hall, Urbana, Ill.

March 3-5—SOUTHERN SAFETY CONFERENCE & EXPOSITION—
John Marshall Hotel, Richmond, Va. Contact: W. L. Groth, Exec. Dir., Box 8927, Richmond 25, Va.

March 3-9—AMERICAN SOCIETY OF PHOTOGRAMMETRY & AMERICAN CONGRESS ON SURVEYING & MAPPING —
Shoreham Hotel, Washington, D. C. Contact: ASP-ASCM, 1515 Massachusetts Ave. N.W., Washington 5, D. C.

March 17-21—AMERICAN SOCIETY OF PLANNING OFFICIALS—
Annual Planning Conference, Sheraton-Palace Hotel, San Francisco, Calif. Contact: ASPO, 1313 E. 60th St., Chicago 37, Illinois.

(Continued on page 187)

WONDER ROAD MARKING GOES INTO HOLLAND TUNNEL

Perma-Line, longer lasting traffic stripe, provides greater safety for busy transportation artery

The famous Holland Tunnel, the world's most travelled underground thoroughfare, now has 34,000 feet of *Perma-Line* to mark its lanes. Over 20,000,000 cars, trucks and buses pass over its four lanes each year—an amazing total of over 54,000 vehicles per day . . . certainly one of the toughest tests for any marking!

Perma-Line lasts 4 to 6 times longer than paint, is applied quickly and easily, forms a tenacious bond with the pavement, sustains full traffic impact in 15 minutes.

That's why there are *Perma-Line* installations in New York City, Chicago, Atlanta, Los Angeles, and other cities across the country. Send for free Holland Tunnel Data Sheet and illustrated brochure.

VEON CHEMICAL CORPORATION
22-09 Bridge Plaza North
Long Island City 1, N. Y.

NAME.....

AFFILIATION.....

ADDRESS.....

New Appointments

Waterbury Opens Office as Consulting Engineer

Lawrence S. Waterbury (Mem., ITE), who retired recently as a partner of Parsons, Brinckerhoff, Hall & Macdonald, has opened his own office as consulting engineer at 26 Broadway, New York.

Mr. Waterbury is an authority on the preparation of reports on traffic and earnings, mass transportation, port development, arterial highway route location and public utility valuation. Under his guidance Parsons, Brinckerhoff developed reports leading to the successful financing of more than two billion dollars worth of highways, causeways, bridges, tunnels and other projects. He continues to serve the firm as a consultant.

Lawrence S. Waterbury

Mr. Waterbury handled traffic and earnings reports for the original and all extensions of the Pennsylvania Turnpike, first of the modern toll roads. One of the biggest studies in which he had a major part was the 415-million-dollar Northern Illinois Toll Highway, financed earlier this year.

Mr. Waterbury has been a practicing engineer for nearly 40 years. He joined Parsons, Brinckerhoff as an associate engineer in 1937 and became a partner in 1947. In addition to the Institute of

(Continued on page 186)

Prisk Appointed Highway Safety Study Director

Charles W. Prisk (Mem., ITE) has been appointed by Federal Highway Administrator John A. Volpe to direct a two-year study of highway safety by the Bureau of Public Roads.

The study was authorized by the Federal-Aid Highway Act of 1956 which directed the Secretary of Commerce to "make a full and complete investigation and study for the purpose of determining what action can be taken by the Federal Government to promote the public welfare by increasing highway safety in the United States."

Charles W. Prisk

Among the subjects which the study will deal with are the need for Federal assistance to State and local governments in the enforcement of necessary highway safety and speed requirements and the advisability and practicability of uniform State and local highway safety and speed laws and what steps the Federal Government should take to promote the adoption of such laws.

Stressing the need for action, Secretary Weeks cited President Eisenhower's message to the Governors' Conference in 1954 wherein he stated that the annual death toll from traffic accidents is comparable to the casualties of a bloody war and called for a grand plan for a properly articulated highway system that solves the problems of speedy, safe transcontinental travel.

In carrying out the present investigation Mr. Prisk and his associates will work closely with many national organizations in the traffic safety field, including the Research Committee of the Advisory Council of the President's Committee for Traffic Safety and the Roberts Subcommittee of the House of Representatives Committee on Interstate and Foreign Commerce. The Automotive Safety Foundation, the National Safety Council, and the Public Health Service also have promised to cooperate.

Two subjects which will be covered are a pilot study of the real causes of highway accidents and a study of the effect of speed and horsepower on accident causation. Others tentatively under consideration are possible means of encouraging highway safety in the manufacture of motor vehicles of all types and the promotion of highway safety education programs.

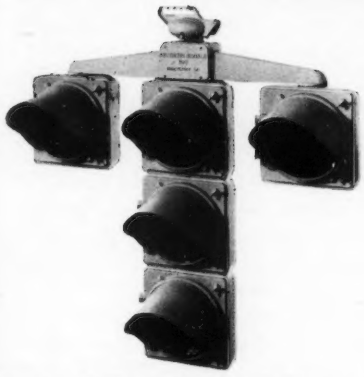
The special investigation of accident causes will emphasize elements of the road *and* the vehicle that lead to poor driver performance and also the psychological behavior of drivers as it affects traffic safety.

"The urgent need for more intensive study of this whole problem is underscored by the mounting toll of traffic fatalities and accidents," Secretary Weeks declared. "During 1955 highway deaths reached 38,000 and from present indications the 1956 toll may exceed 40,000.

"Fortunately the new highway program which President Eisenhower signed on June 29, 1956, promises a large measure of relief," Mr. Weeks continued. "Thanks particularly to full control of access and other modern design features, experts estimate that when the National System of Interstate and Defense Highways is completed an annual savings of at least 3,500 lives will result."

Mr. Prisk, who will direct the current safety study, is well qualified for his new assignment. He is a graduate of the Yale Bureau of Highway Traffic and has been employed in the Bureau of Public Roads on traffic and safety problems since 1935. Now serving as Secretary of both the Traffic Committee of the American Association of State Highway Officials and the Research Committee of the Advisory Council of the President's Committee for Traffic Safety, Mr. Prisk has just completed a term as President of the Institute of Traffic Engineers.

Strictly Business



New 3-Red Signal by Southern Signals

A new signal with three horizontal reds has been made available by Southern Signals.

The use of three reds may seem excessive, but they have a specific purpose. Contrary to the 12″ red and to the "double red" application, the three reds of the "T" signal provide for adjustments of the red indication resulting in definite advantages, according to the manufacturer. These are:

1. Maximum controlled intensity without sacrificing normal distribution.
2. Greater range of readability on curving approaches, maintaining uniform intensity and distribution at all ranges.
3. Maximum coverage without sacrificing intensity.

Experience gained through actual application of the "T" signal has demonstrated its ability to provide effective traffic control. The "Autoflow T" signals are standard production items in the "Autoflow" family of traffic control devices and are currently available for immediate use.

For complete information request Bulletin No. 5609 from Southern Signals, Inc., 222 Beach St., Shreveport, Louisiana.

Mid-City Drive-In Bank Solves Parking Problem

Auto, or Drive-In Banking, once an exclusively suburban phenomenon, is now coming to the aid of the hard-pressed downtown banks where the traffic is heavy and the parking problems are many.

First to experiment with the garage-like mid-city Drive-In is the First National Bank of Birmingham (Ala.), which has installed six banking windows arranged in saw-tooth fashion on the street-level floor of its new six-story Annex.

The windows, designed and installed by the Herring-Hall-Marvin Safe Co. of Hamilton, Ohio, are arrayed against one wall of the banking tunnel, while the space leading to the opposite wall is free to accommodate the passage of two cars simultaneously.

The Drive-In area is equipped with ceiling ventilators and recessed fluorescent lighting.

Each window has 180-degree visibility and 80″ by 24″ counter space for the teller. For security reasons, no contact is permitted between customer and teller. Verbal communication is through a two-way electric intercom. Banking transactions are handled by means of an electronically-controlled tray which operates at the push of a button under the teller's control. Deposits are received and pass books returned through the tray.

Tellers' windows are equipped with individual ventilators, heaters and defrosters. Also, bullet-resistive glass.

Not a separate Drive-In Branch, but an ingenious use of ground floor space, the mid-city Drive-In points the way to underground banking in crowded downtown areas.

Monorail to Be Tried in Florida

As a result of two years of research and 8 months of constant testing on a suspended monorail pilot line at Arrowhead Park, Murel Goodell, President of Monorail, Inc., announced the development of a monorail designed for low-density populations at a cost of $300,000 per mile; and that a contract for the first installation of the new design had been signed for use near Ft. Lauderdale, Florida. This compares with the cost of $500,000 per mile of Skyway Monorail developed by the Houston company for heavy-density population. The lighter design will be known as "type l-d" and the heavier model will carry the designation of "type h-d."

The low density monorail has been engineered because of the need of an express transit service in areas with a scattered population said Mr. Goodell.

The Florida monorail will be 1250 feet in length with a 26 passenger ultra-modern, fiberglass and steel aerial coach used both as an exhibit of advanced transportation and a shuttle system to carry visitors from U. S. Highway #1 to the famous Autorama exhibit where hundreds of complete displays are shown of various transportation types, all in working condi-

(Continued on page 184)

New Publications

Proceedings 9th Annual Northwest Traffic Engineering Conference.

Oregon State Highway Dept., Salem, Oregon, 1956, 155 pp. plano.

This is a report of the ITE Conference held at Oregon State College in May, 1956, under the joint sponsorship of the College, the Oregon State Highway Department and the Western Section, ITE.

Papers are included on urban freeway planning and development, uses of an electronic computer, the National Committee on Urban Transportation, current parking study methods, signing practices for by-passes, and new developments in traffic engineering. Well illustrated, the report makes interesting and valuable reading.

Roadside Development—1956.

Highway Research Board, Washington 25, D.C., 1956, 70 pp.

This publication is actually a report of the Committee on Roadside Development as presented at the 1956 meeting of the Board. While many of the papers are of little concern to the traffic engineer, several may be of some interest.

One paper, by W. H. Simonson of the Bureau of Public Roads, summarizes recently published work in the field of noise control through highway design and another by O. A. Deakin of New Jersey, discusses median planting to reduce headlight glare. A third paper of some concern to traffic people is on the subject of roadside parks on limited access roads, discussed by W. J. Garmhausen of Ohio. Emphasized in the discussion is the need for deceleration and acceleration lanes.

Publication Index, 1950-55.

Highway Research Board, Washington 25, D.C., 1956, 105 pp.

This is a most valuable index, by subject and by author, to papers and reports presented at the 1950 through the 1955 meetings of the Highway Research Board. Some of the publications are out of print but would of course be available in libraries.

The index is a valuable time-saver for any traffic engineer.

Highway Traffic Estimation.

Robert E. Schmidt and M. Earl Campbell, The Eno Foundation for Highway Traffic Control, Saugatuck, Connecticut, 1956, 222 pp. and appendices.

Since the function of a highway is to move traffic, the proper design of the facility must be related to the traffic that will be moved. Since the plans must precede the finished road, there must be an estimate in advance of the traffic demand. On the accuracy of this estimate may well depend the success of the whole road construction program.

This report is a digest of existing knowledge of valid methods of estimating. In the words of the authors, it is an "effort to remove some of the conjecture and guesswork from the techniques of traffic estimating, to lend experience to judgment, and principle to speculation."

Chapters include an introduction which contains a valuable list of definitions of terms, a chapter on land use generation, one on generation of terminals, and chapters on distribution of traffic, traffic growth, and the "critical hour."

Interesting appendices present data on induced and diverted traffic on specific highways.

Traffic Assignment by Mechanical Methods.

Bulletin 130, Highway Research Board, 2101 Constitution Ave., Washington 25, D.C., November, 1956, 77 pp., $1.50.

This bulletin contains five papers and a general discussion on them presented at the 35th Annual Meeting of the Highway Research Board held in Washington, D.C., January 17-20, 1956 as follows:

"California Method of Assigning Diverted Traffic to Proposed Freeways," by Karl Moskowitz, describes punch card machine assignment of traffic to proposed routes using curves developed for California conditions.

"A Mechanical Method for Assigning Traffic to Expressways," by E. Wilson Campbell, describes the coding techniques and machine procedures worked out to facilitate a rapid assignment to expressways in the Detroit area. An appendix by Robert E. Vanderford details the step-by-step machine procedures.

"Traffic Assignment Using IBM Computations and Summation," by R. M. Brown and H. H. Weaver, deals with the probably distribution of traffic on the arterial streets of Lafayette and West Lafayette, Ind., to be expected following construction of a new bridge across the Wabash River.

"A Mechanized Procedure for Assignment of Traffic to a New Route," by J. K. Mladinov and R. J. Hansen, is based on the method used by the State of Washington in analysis of proposed or newly constructed freeways.

"Mechanical Methods of Traffic Assignment," by M. A. Conner and S. H. Hiller, details procedures followed in traffic planning studies by the State Road Department of Florida.

A general discussion by J. Douglas Carroll, Jr., summarizes the salient points of the five papers and emphasizes the practical use of the methods described.

MONORAIL

(Continued from page 183)

tion, used during the 19th and 20th centuries.

The contract calls for completion of the line by the end of 1956 at a cost of $75,000.

An example of "type h-d" monorail is now under construction at the State Fair of Texas grounds in Dallas. Engineers and construction men are working around the clock to complete a portion of the line by October 6th the date of the Fair opening.

The line is being installed by Texas Skyways, a subsidiary of Monorail, Inc., under the direct supervision of Weldon F. Appelt and Felix Davis, officers in Monorail, Inc.

If the line is not completed by Fair time, permission has been granted for the unusual procedure of continuing the erection of the steel towers and aerial beam while under observation of millions of expected Fair visitors.

The original 980 feet of pilot line in Houston has been dismantled with parts being used in the Dallas line. The famous Trailblazer coach has been remodeled after test rides by 65,000 passengers, and will be part of the State Fair System until two (2) new coaches are completed.

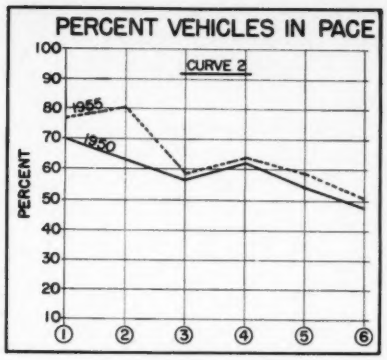
SPEED LIMIT SIGNS

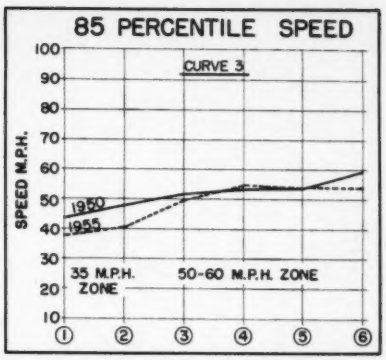
(Continued from page 177)

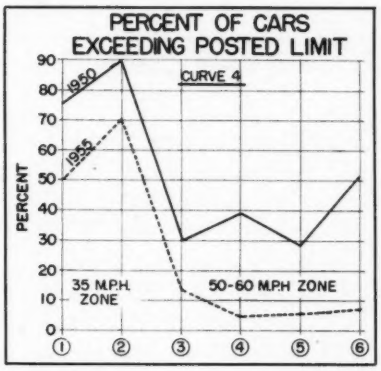
to 4%. The 85 percentile speed for all vehicles in the 35 mile zone dropped from 47 miles in 1950 to 40 miles per hour in 1955 as shown on curve 3. In the 50 and 60 mile zones the 85 percentile speed equaled 54 miles per hour in both 1950 and 1955. However, at stations 3 and 6 in 1950 speeds were higher than the 1955 speeds even though the posted maximum limit was increased from 50 to 60 miles per hour.

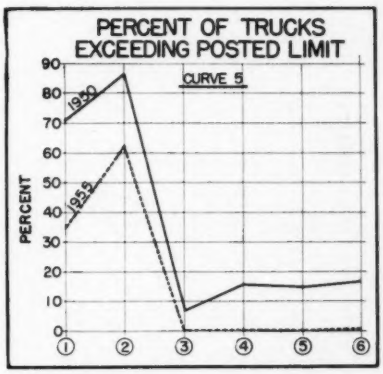
Curve 4 shows that the percentage of passenger vehicles exceeding the posted limit varied considerably in the 35 mile zone. The percentage in 1950 varied between 75% to 90%. In 1955 this varied from 50% to 70%, roughly a decrease of 20% to 25%. In the 50 and 60 mile zones the percentage exceeding the posted limit in 1950 varied between 30% and 50% and in 1955 from 4% to 14% or roughly a reduction of 25% to 30%. A similar variation existed for heavy trucks in the 35 mile zone as shown on curve 5. In 1950 the percentage of heavy trucks exceeding the posted limit varied from 70% to 90%. In 1955 the posted limit varied between 40% and 60%, roughly a decrease of 30%. In the 50 and 60 mile zones in 1950, 8% to 18% of the trucks exceeded the posted limit, while in 1955 less than 1% exceeded the posted limit. Curve 6 shows that heavy trucks exceeding 45 miles per hour in 1950 in the 35 mile zone varied between 10% and 20%; in 1955, from 0% to 3%. In the 50 and 60 mile zones in 1950 the percentage varied between 35% and 50% and in 1955 varied between 30% and 50%. Curve 6 indicates that this percentage increased at stations 4 and 5 but decreased at stations 3 and 6.

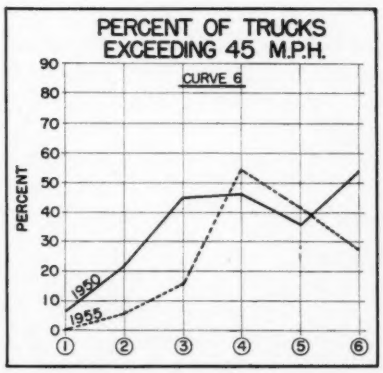
Several other types of curves are presented to show how the average speed varies with various factors. Curve 7 shows the actual volumes that were recorded for one direction only during the time the checks were made. The 1955 volume at stations 1 and 2 is approximately 20% higher than the 1950 volumes. However, at stations 4, 5, and 6 the 1955 volumes are approximately 17% lower than the 1950 volumes. It is believed that this is due to the opening of the Eastern extension of the Pennsylvania Turnpike and the New Jersey Turnpike. The speed plotted against the hour of the day was almost constant throughout the day

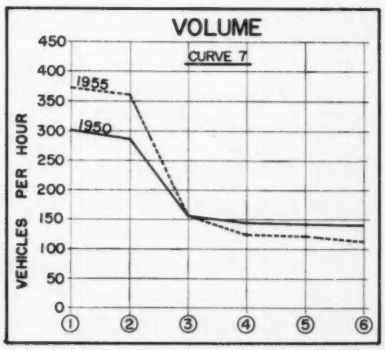


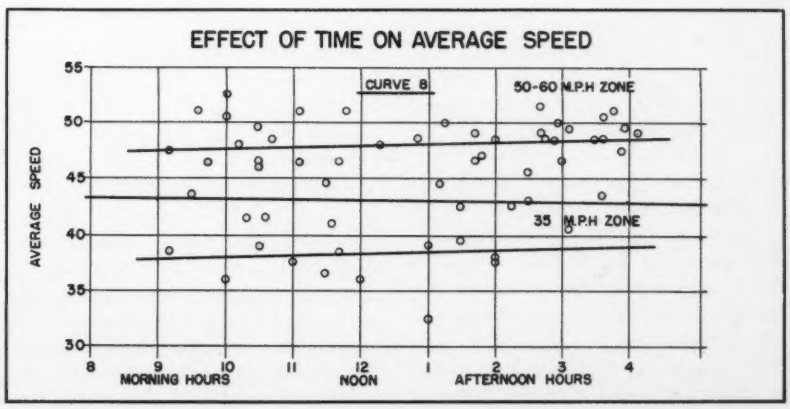


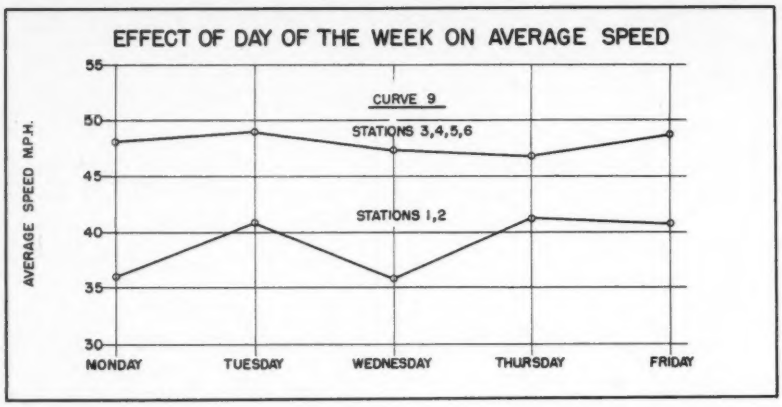


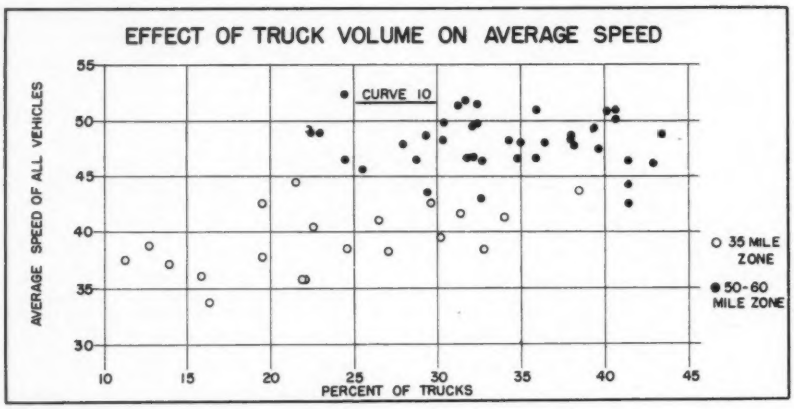


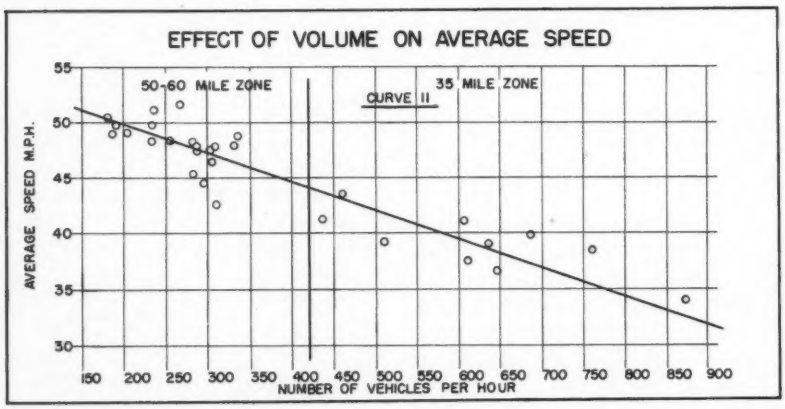












although curve 8 indicates that the speeds are slightly higher around 3:00 to 4:00 P.M. than during other hours. Considering speeds in relation to the day of the week, curve 9 shows that speeds on Monday and Wednesday are slightly less than average for the entire week in the 35 mile zone. Speeds decreased slightly from Monday through Friday in the 60 mile zone; however, it is felt that this has no real significance.

Curve 10, which is actually a series of points rather than a curve, indicates that apparently the presence of trucks has no effect on the average speed of a free-flowing traffic stream in either the 35 mile or 60 mile zones. The truck volumes averaged around 30% to 35% of the total traffic volumes.

Curve 11 shows that the average speed is inversely proportional to the total traffic volume. This has been the findings in numerous other speed studies. However, most significant is the fact that the straight line relationship extends through both the 35 mile and 50-60 mile speed limit zones. This indicates the average speed may be governed largely by volume rather than by posted speed limits. The speed decreases 3½ miles per hour for each 100 vehicles per hour increase in volume.

Summary

In summarizing the results of this report, the "before" and "after" studies in Part I indicated that erecting 35 mile speed signs in a previously designated 50 mile speed zone had a marked effect on the speed of traffic, even though a sizeable percentage of traffic did not observe the 35 mile limit.

In the comparative speed studies in Part II, it was found that generally the 1955 speeds were 3-5 miles per hour slower than in 1950. This was true even though the posted maximum limit was raised from 50 to 60 miles per hour. The percentage of heavy trucks apparently does not affect the speed of free-flowing traffic.

The average speed was found to be inversely proportional to the volume of traffic and the straight line relationship extended unbrokenly through the 35, 50 and 60 mile zones. The average speed decreased 3½ miles per hour for each 100 vehicles per hour increase in volume.

NEW APPOINTMENTS

(Continued from page 182)

Traffic Engineers, he is a member of the American Society of Civil Engineers, American Bridge, Tunnel and Turnpike Assn., The Highway Research Board, American Public Works Assn. and other professional organizations.

La Baugh Appointed To IRF Staff

The International Road Federation has announced the appointment of William C. La Baugh, Jr. as Director of Engineering.

Mr. La Baugh, who is presently Director of Training for the Virginia Department of Highways, joins the IRF staff on January 1.

A graduate of Case Institute, Mr. La Baugh served in the U. S. Navy during World War II. He started to work with the Virginia Highway Department in July 1946, and held the engineering positions which led to Resident Engineer in Bowling Green from October 1951 to August 1954. He has been Director of Training since August 1954.

Institute Affairs

SECRETARY'S COLUMN

The past year has been one of change and yet we believe one of substantial progress for the Institute. The office was moved to Washington and a new staff employed. New contacts were established and the Institute's stature and influence increased. The unselfish work of the officers and directors, plus the help of many members and friends, made this possible.

As this is written, we are looking forward to a new year, the first full one in our new location. Budget-wise this means the first full year of paying rent, and our tentative figures for 1957 show a total expense figure of about $70,000. In 1955 the total was $53,000, and for 1956 will be about $68,000. Income in 1956 was not quite up to expenses, so we must increase our income in 1957 by about $5000 to break even. It is believed that this can be achieved through normal growth of advertising and membership income.

Board Meets January 5 and 6

The Board of Direction meets in Washington on January 5 and 6. In addition to adopting a budget for 1957, the following items are on the agenda:

1. Consideration of approximately 40 applications for new membership and 20 transfers.
2. Preliminary discussion on site for 1959 Annual Meeting.
3. Report and recommendations of Life Insurance Committee on group life insurance plan for ITE members.
4. Report and recommendations of the Board Committee on Membership for revisions in membership requirements.
5. Report and recommendations of the Board Committee on Awards for a policy on 1957 award program.
6. Annual review and renewal of invitations to Sustaining Organizations.
7. Review of plans to date for 1957 and 1958 Annual Meetings.
8. Report of progress in developing a third edition of the Handbook.
9. Review of recommendations of the Technical Council for approval of specific committee reports.

Numerous other meetings are scheduled in connection with the HRB meeting. The Technical Council meets Monday, January 7, as will many committees of the Board. In addition, the Joint Committee on Uniform Traffic Control Devices plans to meet.

ITE Members Active at AASHO

A number of Institute members participated in the recent annual meeting of AASHO held in Atlantic City. The Committee on Traffic, of which Past President Prisk is Secretary, had two sessions with interesting discussions of design principles, electronics, and signing. The latter question was discussed in relation to the Interstate System, and it is hoped that some of the material presented can be adapted for use in the magazine.

Nominating Committee Appointed

President McMonagle has appointed the Nominating Committee for 1956-57, consisting of the following:

A.L. Hutchinson, California, *Chairman*
T. T. Wiley, New York
Wallace L. Braun, Washington (D.C.)
Harry Porter, Jr., Chicago
Harold G. Eckhardt, Ohio

Officers and directors to be nominated by this committee include president, two vice presidents, secretary-treasurer, and directors for Districts 1, 2 and 4.

COMING EVENTS

(Continued from page 181)

September 9-13—ILLUMINATING ENGINEERING SOCIETY —

National Technical Conference, Biltmore Hotel, Atlanta, Ga. Contact: IES, 1860 Broadway, N. Y. 23, N. Y.

September 23-27 — INSTITUTE OF TRAFFIC ENGINEERS—

Annual Meeting, Statler Hotel, Detroit, Mich. Contact: ITE, 2029 K St. N.W., Washington 6, D. C.

October 13-15 — AMERICAN INSTITUTE OF PLANNERS —

Annual Meeting, Congress Hotel, Chicago, Illinois.

October 21-25—NATIONAL SAFETY COUNCIL—

Annual Safety Congress & Exposition, Congress, Conrad Hilton and other Hotels, Chicago, Ill. Contact: NSC, 425 N. Michigan Ave., Chicago 11, Illinois.

POSITION AVAILABLE

ENGINEER WANTED

TRAFFIC ENGINEER

Experienced
Graduate Engineer
for General Traffic Studies

LIBERAL SALARY
VACATION WITH PAY
COMPANY PAID
HOSPITALIZATION and
RETIREMENT PLANS

SUBMIT
COMPLETE
RESUME

of education and experience, salary requirements, references, and availability date with first letter.

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Section News

CANADIAN SECTION

News from November Newsletter, Grant A. Bacchus, Editor.

ELECTION RESULTS
1956-1957 EXECUTIVE

President: K. S. Vaughan-Birch
Director, Traffic Division
Vancouver, British Columbia

Vice-President: S. Cass
Traffic Engineer
Municipality of Metropolitan Toronto
Ontario

Secretary-Treasurer: G. A. Bacchus
Ass't Traffic Engineer
Metropolitan Toronto Planning Board
Toronto, Ontario

Western Director: W. Finnbogason
Traffic Engineer
Winnipeg, Manitoka

Central Director: A. Lomax
Traffic Coordinator
Hamilton, Ontario

Eastern Director: J. Barriere
Traffic Engineer
Montreal, Quebec

Past-President: W. Q. Macnee
Traffic Engineer
Province of Ontario

New Members

We are pleased to welcome two new members from Canada to the Institute of Traffic Engineers whose election was announced at the recent San Francisco meetings.

Mr. Yves H. Beauregard, Montreal, Quebec
Mr. John H. Harding, Victoria, B.C.

The addition of these two members increases our total Canadian Section membership to 47 persons.

Constitution Amendment

Our proposed amendment to the Canadian Section constitution was approved by the Institute Board of Direction in San Francisco. This amendment will allow non-engineers to become Local Section Affiliate members of the Canadian Section and an appropriate application form is now being drafted. Any persons wishing information and application forms are requested to contact the Secretary-Treasurer.

Annual Meeting of Canadian Section, September, 1956

Considering the distance to be travelled a very good Canadian representation attended the San Francisco convention of the Institute. Eleven Canadian ITE members and five interested parties were in attendance as well as ten wives, making a total of twenty-six Canadians. The main portion of the section's Annual Meeting was the nomination of officers for the election of an executive for the coming year, the results of which are printed elsewhere in this newsletter. Discussions were also held relative to an application form for local section affiliate membership and this matter was referred back to a committee consisting of W. Q. Macnee and G. A. Bacchus.

Toronto Group Meeting—October 25, 1956

The first meeting of the season was held in Toronto, attended by 42 persons. Among those present were *George W. Howie* of Cincinnati who was guest speaker, and *Herb Levinson* from New Haven.

Reports were heard on the ITE convention in San Francisco and the C.G.R.A. convention in Quebec. *Walter Macnee* then discussed the activities of the committee developing the Canadian Manual of Uniform Traffic Control Devices and a report was heard from *Al. Friedman* on a test of a proposed new railway crossing sign. *Mr. Howie* then summed up current committee activities in the Institute and answered numerous questions from those in attendance. We are indebted to *Mr. Howie* for taking time out in his busy schedule to visit us on this occasion.

NEWS BRIEFS

Windsor

Eric Wiley has been promoted to Director, Traffic Engineering Department of the City of Windsor. He formerly held the post of Traffic Coordinator of the Traffic Control Division.

Vancouver

E. D. Sutcliffe has been promoted to the position of Executive Assistant to the President, Western Development and Power Limited. He was elevated to this post from Executive Assistant to the General Manager of Transportation.

Toronto

In August the combined resources of St. Thomas Metal Signs, Grotelite, Armstrong Cork Co. and E. A. Horton Sales Co. hosted a group of seventeen Traffic Engineers and Traffic Coordinators to a very fine dinner at the Northgate Hotel in Toronto. After the meal the group travelled to Downsview Airport where we viewed various types of signs using the new Grotelite reflective sheeting.

Peterborough

We were all very sorry to hear of the recent accident suffered by *Ed Horton* while he was travelling to Quebec for the C.G.R.A. convention. Ed is convalescing at his Peterborough home and I am sure that he would appreciate hearing from the membership.

Toronto

Roger Truemner has been awarded a fellowship to study at the University of Toronto. He hopes to acquire his Master's degree in Town Planning.

METROPOLITAN NEW YORK SECTION

News from November issue of Section Newsletter.

October 25 Meeting Notes

The afternoon session of our meeting began on schedule at the City Hall in East Orange. Following a welcome by Mayor William McConnell, a panel of officials told of the off-street parking program of that city. Leaving City Hall by bus, the members of the Section made a field inspection of existing city operated parking lots and the sites of others which are planned or under construction.

Thanks to our gracious hosts and the cooperation of the "weather-man" the events of the afternoon were much enjoyed by the approximately 25 members and guests who participated.

In the course of the social hour and dinner at Pierre's Restaurant the group swelled to 47 members, city officials and guests.

After calling the meeting to order at about 8:30 P.M., *President Quimby* told of the action that had been taken on motions which were passed at the last meeting.

1. The ITE Board of Direction has been advised of our intention to formally invite the Institute to hold the 1959 Annual Meeting in New York City.

2. *Charles Murphy* submitted our Section resolution on the use of Stop signs to the ITE Technical Council at the San Francisco Meeting.

3. Our Section will sponsor a session on traffic engineering during the March 18-22 Meeting of the Greater Nwe York Safety Council. *Bill Corgill* is in charge of arrangements and Messrs. *Maeder, Cyr, Murphy* and *Flynt* will serve as speakers.

In line with the new ITE Technical Council policy of assigning to the various local Sections the work of drafting Institute policy on specific subjects, our Section has been asked to outline an Institute policy on Curb Parking. The members of our Section who will undertake this work include Messrs. *Avins, Cyr, Hubbell, Klar, O'Leary, Simoff and Petrillo.*

Following a brief report by *Lou Bender* on the Technical sessions of the San Francisco Meeting, *President Quimby* requested *Ed Wetzel* to report on recent action that had been taken by the ITE Board of Direction.

Our Section membership was pleased to learn by way of his introduction of *Ed Wetzel's* election as Secretary-Treasurer of the ITE. We all know of his unselfish contribution of time and effort to the ITE and will agree that his election to the important position is well deserved. Among the items on which *Ed* reported were the following:

1. The ITE is now officially represented by six members on the National Committee on Uniform Laws and Ordinances.

2. After reviewing reports of the Sections which have sponsored Annual Meetings in recent years, the Board has adopted a "Manual of Conduct of Annual Meetings" for the future guidance of sponsoring Sections.

3. The Board is considering a suggestion that the locations for Annual Meetings be determined more than two years in advance so that the various host Sections will have more planning time.

4. The Board is investigating a plan for low cost term life insurance which could be made available to all ITE members.

President Quimby then briefed the resolutions which had been passed at the Annual Meeting. Particular interest was expressed in that resolution which urged that engineering salary structure be reviewed to assure that compensation is commensurate with the nation's needs and the competitive salaries of private industry. On this happy note the Meeting adjourned.

METROPOLITAN MEMBER NEWS

Mr. Eugene Fitzgerald

A new planning director, *Mr. Eugene Fitzgerald,* has been appointed by the City Planning Commission of Buffalo. This very important post has been vacant for a rather long period. *Mr. Fitzgerald* and *Henry Osborne* will indeed make a redoubtable team when it comes to advancing the City's best interests.

Mr. Kenneth W. Crowley

Congratulations are in order to *Ken* following his October 27 marriage to Ann Theresa Connors in New Haven. After the honeymoon trip the *Crowleys* will reside at 141-30, 84th Road, Briarwood 35, New York.

Mr. Paul C. Petrillo

On October 10 *Paul* and *Katherine* became the parents of a 6 lb. 15 oz. baby girl. The newcomer's name is Katherine Ruth.

NEW FACES

Mr. Gordon K. Gravelle

Mr. Gordon K. Gravelle was recently appointed Deputy Commissioner of Traffic, City of New York. *Gordon* is no stranger to many of the Section members who have been associated with him in their work or in matters concerning the ITE. A native of Wolverine, Mich., he is a graduate of the University of Michigan and the Yale Bureau of Highway Traffic. During World War II he served in the Engineer and Transportation Corps and now holds a reserve commission of Lieutenant-Colonel. Prior to accetping the New York City assignment, he was employed as Transportation Engineer with the Automotive Safety Foundation, Washington, D.C. *Gordon* is a member and director of the ITE and an extremely active member of the Highway Research Board.

MID-ATLANTIC SECTION

Excerpts from Minutes of Meeting, November 8, Harrisburg, Pennsylvania.

The second meeting of the Mid-Atlantic Section of the Institute of Traffic Engineers held November 8, 1956 in Harrisburg, Pennsylvania, with *President Michael J. Gittens* presiding and 29 members and guests present.

President Gittens introduced *David M. Baldwin,* Executive Secretary of the Institute from Washington, who acknowledged the introduction with a few remarks. He emphasized the legitimacy of the 13th child of the ITE and informed us that with the members elected at the Board meeting in San Francisco, as of today, the total membership stands at 1,022.

Mr. Baldwin outlined a few of the projects being considered by the Board of Direction such as strengthening membership qualifications, the possibility of life membership, and told us about the possibility of life insurance being offered to membership without examination and at very low cost.

Mr. Baldwin denied emphatically the reorts that the ITE in San Francisco viewed the Federal Highway program as "too much and too soon." He said that no such statement was made officially or unofficially, and explained that the Institute does not so feel. He informed us that in answer to many questions, the "Part II" of the October issue of TRAFFIC ENGINEER is the index and invited us to visit him at the Washington headquarters whenever we are there.

Correspondence with the New York Metropolitan Section was discussed and it was agreed that the New York Section would retain Mercer County, N. J. and that membership in Western New York would affiliate with either New York or Philadelphia at their discretion.

New officers elected were:

President ..... Michael J. Gittens
Vice-President ..... Paul Muffley
Directors..John Comiskey, Dick Overmyer
Secretary-Treasurer ... Wm. S. Canning

It was reported that there remained a balance of $312.00 more or less after defraying of expenses of the National meeting of the Institute in Pittsburgh last year, which the Committee and the Institute had directed should be turned over to the Mid-Atlantic Chapter upon the completion of the organization of this section.

Discussion followed concerning the location of sites for forthcoming meetings. The location of the Eastern meeting was selected for Philadelphia or vicinity and the Western meeting in the Pittsburgh area subject to action by the Program Committee.

The Annual meeting was suggested to be held at Pennsylvania State University, University Park, Pa., or at Harrisburg as might be decided by the Program Committee, the same discretion was left with the Program Committee concerning the possibility of a social meeting.

President Gittens appointed the following Committees:

NEWS LETTER COMMITTEE:
Paul Muffley, Chairman, (Harrisburg)
Eugene Simms, Harrisburg
Tony Miscimarra, Pittsburgh
Robert Mitchell, Washington

PROGRAM COMMITTEE:
Lew McIntyre, Chairman (Pittsburgh)
Stephen Butterfield, Philadelphia
Hawley Simpson, Philadelphia

LEGISLATIVE COMMITTEE:
Clarence W. Hanson, Chairman (Harrisburg)
Clark McClelland, Harrisburg
Dick Overmyer, Philadelphia

SOCIAL COMMITTEE:
Jack Comiskey, Jr., Chairman (Harrisburg)
Don McNeil, Pittsburgh
Wm. R. Carrow, Delaware

MEMBERSHIP COMMITTEE:
H. Bruce Murray, Chairman (Phila.)
Gib Reen, University Park, Pa.
Bill Miller, Delaware
Bob Coleman, Harrisburg
Ted Forbes, Pittsburgh

There followed a discussion concerning the appointment of the Legislative Committee and it was decided that the Program disseminate to the Chapter membership through the medium of the News Letter, information concerning any legislative matters which might be of interest to the membership.

President Gittens then introduced *Mike Shipley,* the newly appointed Director of the Bureau of Highway Safety in the Department of Revenue. *Mr. Shipley* gave a brief outline of his program of the proposed organization of the Governor's Highway Safety Council, and after expressing appreciation at the opportunity to be present at the Chapter Meeting, asked that he might have the privilege of coming back again. This matter was quickly settled by extracting dues from *Mr. Shipley* and making him a member of the chapter.

WASHINGTON (D.C.) SECTION

The first meeting this year of the Local Section of the Institute of Traffic Engineers was held at the All States Dining Room. The meeting was well-attended with a total of 44 members, affiliates and guests present.

After a short business meeting the rest of the evening was turned over to *John Mitton,* Assistant Director and Traffic Engineer for the Department of Vehicles and Traffic, who discussed the proposed traffic signal system for the District of Columbia. He made quite a strong plea for the use of predetermined programs in connection with inter-connected signal systems in the downtown area.

The Baltimore contingents — *Barnes, Booth, Cleary* and *Rudden* — had several questions with regard to the advisability of traffic actuated programs in Washington. The fighting was rather subdued. The meeting ended with the conclusion that there are at least two ways to program traffic signal timing in the downtown area.

Among those attending was *Dave Solomon*—a member of the Local Section and this year's winner of the Past Presidents' Award for his paper on "The Effect of Letter Width and Spacing on Night Legibility of Highway Signs." Certainly this title in itself deserves a prize!

George Howie, from Cincinnati, was among the honored guests from out of town.

WESTERN SECTION

News from WesternITE, November issue.

San Diego Area

John McDonald, District XI Traffic Engineer, expressed mixed emotions at *Chuck Strong's* departure for study at the Yale Bureau. *Chuck* and *Leason* were given a royal send-off at the dinner party given by *Paul* and *Janice Fowler.*

Paul Fowler reports that the County crew is knee-deep in a comprehensive county-wide guide sign inventory and replacement program. County speeders will soon be checked periodically by a speed meter which *Paul* is eagerly awaiting.

On August 8th, the traffic problems created by the "California Story," a historical pageant presented as a part of San Diego's Annual Fiesta del Pacifico, were studied by *Jim Reading,* the *Luckenbachs, Strongs, Robbins, Boumans, Durhams, Fowlers,* and *Halls.*

Ed Hall reports the completion of the field collection of Home Interview, Roadside Interview and Transit Interview O-D data and that this data is being coded and sent to the machines for processing.

The arrival of *Klondike K. Gilbert* has been duly celebrated and *Keith Gilbert* reports that he has regained his proficiency in the maintenance of dry diapers.

Don Robbins, City Lighting Engineer, reports that 162 new mercury vapor lights have been installed in the downtown area of San Diego with an average candle power in excess of 4 foot candles.

On September 5th, the San Diego Section held a luncheon and had a guest speaker, *Mr. Harry Silke,* the newly appointed Industrial Development Coordinator of the City of San Diego. WesternITErs attending were *Marty Bouman, Don Robbins, John Tsiknas, John McDonald, Jim Reading, Hal Durham, Lucky Luckenbach, Ed Hall, Paul Fowler, Keith Gilbert.* San Diego Area was pleased to have 14 guests representing the California Division of Highways, the City Engineer, City Transportation Research Staff and the Chamber of Commerce.

At the conclusion of the meeting, the officers for the coming year were welcomed, *Paul Fowler* as Area Chairman and *Keith Gilbert* as Area Scribe. The Area members expressed their appreciation to *Marty Bouman* for a job well done in conducting an active, interesting and pleasant year for the San Diego members.

The Proceedings of the Eighth Annual Meeting of the Western Section have been mailed to all those in attendance at the San Diego Meeting. Copies may be obtained by writing to *Marty Bouman.*

Northwest Area

Mark Kask, recently accepted as a Junior Member, is taking a nine-month educational leave of absence from the Washington Highway Planning Division to attend the Purdue Graduate School. He will obtain a master's degree in Transportation next June.

Bob Hansen spent most of the month of September in California but still missed the National ITE Convention. *Bob* has been given the assignment of heading up the Electronic Computer Division for the Washington Department of Highways, and for his new assignment met in Sacramento, California, with representatives of the other Highway Departments utilizing computers. Following this, he took in the two-week course on Traffic Simulation by Computers at U.C.L.A.

Phil Brown recently returned from graduate work at the I.T.T.E. and is now deeply immersed in the Washington Highway Planning Division workload. Since coming back he has seen the Planning Division staff depleted by transfers and terminations. Prospective highway planners, please send in your applications.

Bill Kingman, District Traffic Engineer for the Department of Highways in Wenatchee, is presently at the Yale Bureau of Highway Traffic for a year of graduate work. Bill received an A.S.F. fellowship and will return to the Department of Highways after finishing the school year. His assistant, *Bruce Davidson,* is ably filling his shoes.

Yosh Kosai, City of Tacoma Traffic Engineer, is starting out like a ball of fire as the new Area Chairman. He is organizing an Area "get-together" for the November 10 football game in Seattle between the University of Washington and U.C.L.A.

Roy Sawhill left the City of Seattle Traffic Engineering Division in September to teach at the University of Washington Department of Civil Engineering. *Roy* will take over instruction in traffic engineering. He will also work on research projects for the Washington State Council for Highway Research. *Roy* has been doing traffic engineering consulting work on the side recently under the name of "Traffic Engineering Consulting Service."

John Chaffee is preparing the traffic control devices that will be used on the Spokane Valley Freeway which will be opened to traffic early this Fall. *John* has designed specially constructed over-size aluminum destination signs utilizing Stimsonite letters and reflective border.

Bob Curry, since leaving Headquarters office and taking up his duties as District Traffic Engineer in Seattle, has become a "telephone man." His current activities in instantaneous trouble-shooting and smoothing oil on troubled waters are a far cry from his research jobs that he performed while in Olympia.

Tom McLeod, a new Junior Member, reported on June 18 as a geometric design expert in the Washington Highway Department Traffic Engineering Division, filling the vacancy created by the departure of *Dick Long* for the eastern seaboard. Tom recently received his masters degree in transportation from I.T.T.E. at Berkeley. He and his wife started school in the Fall of '55 and they wound up with a 7-months old daughter which leads one to believe that there is a course in California which is not on the curriculum at Yale. *Tom* graduated from the University of Washington in 1952 with a B.S.C.E. After spending two years in the service, he assisted *Jim Gallagher* in Vancouver for one year prior to starting his post-graduate course.

Rex Still was awarded a plaque by the Washington Motor Transport Association for "outstanding contribution in traffic safety." The plaque was presented to *Rex* by *Neil Curry,* board chairman of A.T.A., who was in attendance at the annual meeting of the Washington Motor Transport Association in Spokane.

Ralph Kerslake was promoted this summer from District State Aid Engineer in the Washington Highway Department District Office in Seattle to District Construction Engineer in the Washington Highway Department District Office in Wenatchee.

Elmer Clees was also promoted from Senior Planning Engineer in the Washing-

ton Department of Highways to Assistant Work Control Engineer. On his last day at the Planning Division, the office force surprised him with a "coffee and doughnut" party, at which time they presented him with a Schaeffer desk pen set.

Sacramento Area

The Sacramento Area was host to a group of 92 at a dinner on October 4th. This is an annual affair which the Sacramento Area sponsors in conjunction with the meeting of the Governor's Traffic Safety Conference. Attendance at the engineering division at this year's conference was somewhat below normal because of the conflict with the ITE Convention in San Francisco and the County Engineers' meeting in San Diego during the previous week. *Gran Parmeleee* served as chairman of the engineering division this year. The steering committee of this division, which includes in its membership, *George Webb, Barney Switzer, Mel West* and *Dud Stevens,* appointed *Mel West* to be chairman of the engineering division of the Governor's Traffic Safety Conference for 1957.

Contra Costa County is losing the services of a brilliant young engineer of traffic as *Basil Andrews* marches off to Georgia to set fire to Savannah's transportation problems. *Basil* is the new traffic engineer for that southern city and all his friends can keep in touch with him by writing in care of the Metropolitan Planning Commission at the Savannah City Hall. Good luck to you-all *Basil* Boy!

Idaho Area

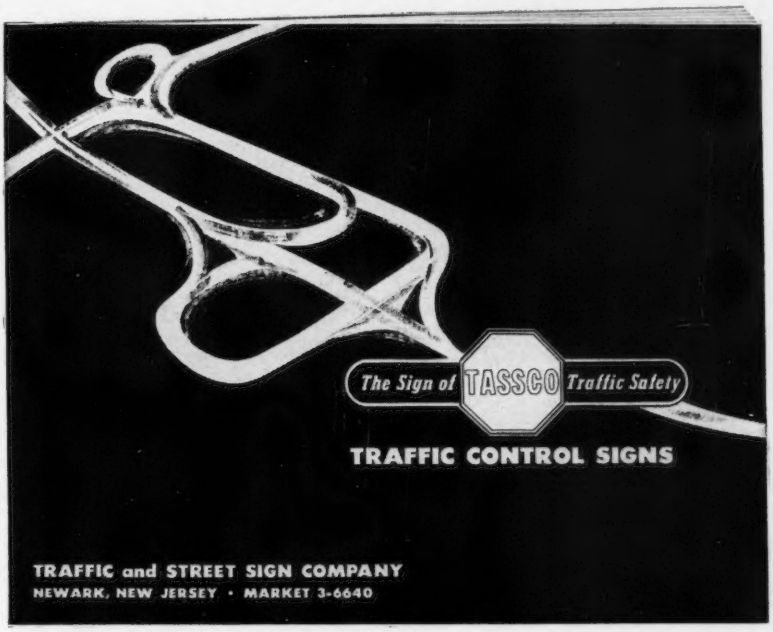
Idaho now has three members of the Institute and, of course, the Western Section. *Eugene Burbidge* is the newest addition. *Lewis J. Ross* and *E. L. Mathes* are the other two. *Gene* is with the Highway Planning Survey of the Department of Highways.

Lew Ross together with *Frank Leonard* of the Design Division of the Idaho Department of Highways attended the AASHO Design Committee meeting held in Portland on October 15th and 16th. The principal topic of discussion at the meeting was "Interchanges." It is reported that the time was well spent and that a good deal of valuable information was assimilated from the various presentations.

Al Mathews was a recent visitor to Boise. We were happy to have *Al* again come our way to re-assure us that he is very much alive and still in the business—you know the kind. It had been so long since his last stop here we had begun to wonder if he was still in circulation or had "just faded away."

The second one-way couplet to be used in Idaho was placed in operation in Lewiston on 18 October 1956. According to newspaper and general public comment, the conversion appears to be receiving favorable acceptance. Some permanent channelization remains to be done at the two ends of the couplet but the changeover seemed to take place very smoothly with a minimum of confusion. Good newspaper, radio and TV publicity prior to conversion assisted materially in this endeavor.

A new section of expressway was recently opened to traffic in Pocatello. Approximately one and one-half miles in length, control of access was obtained through the use of frontage roads. One hundred fourteen, 20,000 lumen mercury vapor luminaires modified for straight series operation were installed to provide high intensity illumination. This is the first uni-ballast control equipment system to be placed in service in the State. It appears to be functioning well and the City seems to be well pleased with the improvement.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Letters to the Editor

Signing the Interstate System

Sir:

I have read with interest the article "Marking the Interstate System of Highways," by Mr. Burch in your October issue. Unfortunately I cannot agree with his proposal for a new distinctive route marker for the Interstate System. As a former employee of the traffic engineering section of the Texas Highway Department I should like to set forth my reasons for disagreement.

First, the Interstate system is basically aimed at reconstructing the most traveled 40,000 miles of our existing highways to standards that will adequately serve the traffic volumes of 1975. The routes are those that people are traveling today, whether signed as a U. S. route or as a State route, and therefore need not be changed.

Second, very few vehicles on any section of the Interstate system will be traveling the full distance from New York to Florida or Philadelphia to San Francisco, and thus find a continuous number useful. By far the larger portion of traffic at any point on the system will be short-haul traffic principally made up of repeaters. While the length of the short haul may vary from a few miles to several hundred miles, these drivers usually do not need route markers for their trips.

Third, adding an additional system of route numbers to the system already existing in the states would tend to increase route number confusion. Most people, when talking about routes, giving directions, and traveling, do not now distinguish between U. S. Route 90 and Texas Route 90, they speak of them both as "90." Consequently, many states have taken steps already to eliminate any duplication of route numbers between the U.S. system numbers and state system and secondary system numbers. It is quite conceivable that this confusion would be intensified by superimposing another system of route numbers on the existing nationwide and state systems.

Fourth, I believe that route numbers are not supremely important in guiding motorists and that people drive more by destination rather than by route. Mr. Burch cites the New Jersey Turnpike sign as an example of a route marker with good target value. I submit that this marker is used as a destination sign along routes leading to the Turnpike rather than as a route marker on the Turnpike, but I would not care to see the use of such destination signs multiplied. There are too many little signs on most ordinary streets and highways now which are cluttering up the roadside.

Of course, the reply can be made that how will people find the routes. The answer is double, follow the traffic, and follow the road legend of quality and surfacing shown on all oil company and official state highway maps.

This letter must concur wholeheartedly with Mr. Burch's statement, "The needed and necessary information to properly inform an unfamiliar driver while he is traveling the Interstate System will require bigger, better, and more adequate signing." But I feel what is needed is not new route markers but more and better information and destination signs and intensive research on improving existing route and directional signing.

The opinions expressed in this letter are entirely those of the writer and should not be construed as reflecting any policy of the Traffic Institute.

Yours very truly

W. R. Stebbins, Jr., *Research Asst.*
Division of Research and Development
Northwestern Univ. Traffic Institute

Henry A. Haugh, Jr. Teacher, Inventor, Engineer, Dies

Henry A. Haugh, Jr., pioneering inventor of traffic actuated control systems, died in his sleep early in the morning of November 14, 1956 in Camden, New Jersey while on a business trip.

Henry A. Haugh, Jr.

Mr. Haugh was associated with Automatic Signal as an engineering executive since 1927, and was one of a group which founded the company at that time to manufacture and market traffic control systems based on his pioneer inventions, the first of which he had developed independently while he was a young instructor on the Electrical Engineering faculty at Yale.

Mr. Haugh was a native of Derby, Connecticut and resided there until the past few years when he made his home in Orange, Connecticut. Mr. Haugh graduated with honors from Yale University in 1920 with a Ph.B. degree in electrical engineering from the Sheffield Scientific School there, and was a member of the scientific honor Society of Sigma Xi.

Mr. Haugh, known as Harry Haugh to his associates and many friends throughout the United States, often was called upon to tell the story of how his irritation at being held up needlessly by a red traffic light without any cross traffic in the 1920's led to his invention of a traffic actuated control system, by which traffic is able to regulate itself through automatic control of traffic signal changes and timing in response to traffic detectors in the road, and thus to avoid unnecessary delays and to enable traffic to obtain the safety of traffic signal protection while at the same time finding the signal more often green than red.

The earliest permanent public installation of a fully automatic traffic actuated signal system was inaugurated by Mr. Haugh and his associates in April, 1928 at Orange and Humphrey Streets in New Haven, Connecticut after test installation there in 1927, and is still operating today.

Mr. Haugh was widely known for his ability to explain complex electrical apparatus and traffic control systems in simple down-to-earth terms and with a keen sense of humor which made him very popular in engineering and service instruction throughout the country, and as a speaker at conventions and other meetings of technical groups.

Friends and associates of Mr. Haugh are considering the establishment of a scholarship fund in his memory at Yale University.

Membership Applications

The following applications have been received since the list of applicants published in the December issue.

APPLICATIONS FOR TRANSFER

ELLIOTT, Earnest Wilfred
Chief Planner
Connecticut Survival Plan Project
92 Farmington Avenue
Hartford, Connecticut
December 6, 1956 for ASSOCIATE grade

GREGORY, Randolph Thomas
Director of Traffic & Planning
Room 305, City Hall
Waco, Texas
November 23, 1956 for ASSOCIATE grade

KUNDE, George Henry
Traffic Engineer & Director of Off-Street Parking
3343 Pan American Drive
Miami, Florida
November 7, 1956 for MEMBER grade

NEW APPLICATIONS

GRIMBLE, Louis George
Partner, Stanley, Grimble, Roblin Ltd.
11605 Jasper Avenue
Edmonton, Alberta, Canada
October 31, 1956 for ASSOCIATE grade

HAYDEN, Buford Marine
Associate, Seward H. Mott Associates
2151 K Street, N.W.
Washington 1, D.C.
November 14, 1956 for ASSOCIATE grade

LACOSTE, Jean
Director of Traffic
City of Montreal
City Hall
Montreal, Quebec, Canada
November 20, 1956 for ASSOCIATE grade

PIEDRAHITA, Jose Antonio
Consulting Traffic Engineer
City Government of Bogota
Carrera 19 #11-17
Bogota, Colombia, South America
October 13, 1956 for JUNIOR grade

POMROY, Henry Swyers
Traffic Engineer I
Pennsylvania Department of Highways
Box 711
Franklin, Pennsylvania
November 30, 1956 for ASSOCIATE grade

Yearbook Changes

HARVEY, Julien H. (Honorary)
Richards Lane, New Canaan, Connecticut.

LONG, Richard R. (Associate)
Associate Traffic Engineer, Wilbur Smith & Associates.
SEND MAIL: 111 South Meramec Street, Clayton 5, Mo.

MANNING, John I. (Junior)
Assistant City Planner, 308 Winkworth Parkway, Syracuse 4, New York.

RAYMOND, William L., Jr. (Junior)
Highway Engineer, Gannett Fleming Corddry & Carpenter, Inc., 600 North Second Street, Harrisburg, Pennsylvania.

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Reference Notes

Stresa, Italy, Scene of International Study Week In Traffic Engineering

By Wolfgang S. Homburger

An International Study Week in Traffic Engineering was held at Stresa in the Italian Alps in October 1956. It was the third in a series of such conferences which are sponsored by the World Touring and Automobile Association (a "clearing house" for automobile and touring clubs), the Permanent International Association of Road Congresses, and the International Road Federation.

The study week concerned itself with eight themes:

1. Prediction of Future Increases in Traffic and Vehicle Registration
2. Psychology and Education of Road Users
3. Cost/Benefit Analyses
4. Accident Rates (Causes of Accidents)
5. Losses due to Accidents
6. Traffic Control
7. Factors Affecting the Capacity of Roads
8. Traffic Aspects of the Planning and Design of Urban Expressways

For each of these themes a number of papers were submitted by leading authorities in their fields. These papers were translated, printed and distributed well in advance of the conference, giving participants an opportunity to read the contributions and prepare criticisms, discussions or additional material while still at home with their own reference resources at hand. Since the papers were not read again at the study week, it was possible to solicit more contributions than is ordinarily possible. Also, it was not necessary to limit requests for papers to those authors who would be likely to attend the conference.

At the study week, papers on each theme were summarized by a "reporter," who was also free to add his own contribution and criticism. The majority of available time was devoted to open discussion, which was of a high caliber. The conference was conducted in four languages simultaneously by using interpreters in soundproof booths who translated from the language used by the speaker into the other three tongues. Participants could select a language by plugging their earphones into the appropriate circuit.

For American traffic engineers the papers of themes 3, 4, 6 and 7 will be of most interest, although the other themes also contain much useful information. On the Cost/Benefit topic a paper by Dr. M. E. Feuchtinger of Germany shows the very detailed analysis which was undertaken to compute the user costs and benefits of alternate methods of carrying a highway over a canal. Both bridges and tunnels were analyzed, each with four alternative maximum grades. Emphasis was placed on the costs incurred by a vehicle in motion under various conditions. M. A. Schuhl of France studied the influence of grades on speed and fuel consumption of European vehicles. More general discussions of the costs and benefits of highway construction were contributed by Dr. G. Charlesworth of the Road Research Laboratory of the British government, and by Mr. Richard M. Zettel of the Institute of Transportation and Traffic Engineering of the University of California.

On the theme on accidents a paper by Dr. Ing. F. Bitzel of Munich on "Accident Rates on German Expressways in Relation to Traffic Volumes and Geometric Design" provoked lively discussion on the problems of isolating a single factor as the cause of an accident. Two other papers deal with accidents during hours of darkness, and with the effect of installing highway lighting on a French expressway. A contribution by M. G. Claes of Belgium discusses mathematical processes to be used in comparing accident rates.

One paper in the series on traffic control, reports on the work done in recent years by Dr. F. V. Webster of the Road Research Laboratory on the relationship of traffic signal setting to expected vehicle delays. The data were developed by simulation methods which were analyzed by a delay computer. A sample is shown of a set of tables which have been prepared in such a manner that an engineer may readily see what effect a proposed signal timing program will have on vehicular delays. M. A. Herzog describes the signal installation at the Arc de Triomphe in Paris, one of the most complicated "intersections" in existence anywhere. Other interesting discussions of signal problems are given by M. E. M. Goelen of Belgium and Mr. W. Hadfield of Great Britain. Mr. Burton W. Marsh (Mem. ITE) contributed a paper on "Traffic Control for Pedestrians" for this theme.

The papers on capacity generally use American research into highway and intersection capacities as a starting point and then discuss, adjust or reject various factors for European conditions. No American authors had papers on this theme, but every conference participant received a copy of Highway Research Bulletin #112, "Effects of Traffic Control on Street Capacity," and the reporter for this topic spent considerable time discussing its contents.

The reporters of the eight themes also presented much material of their own, which will be published together with a summary of the discussions of study week participants at a later date. English translations of all papers distributed before the conference are available now from the World Touring and Automobile Association, 32 Chesham Place, London S.W.1. at a price of about $5.60.

The registration list of 464 included some of the foremost engineers, researchers and teachers of traffic engineering in Europe, and a number of representatives from the other continents. Thirty-three countries and the United Nations were represented; the distribution being as follows:

Italy	112
France	66
Germany (West)	60
Great Britain	33
Netherlands	31
Switzerland	28
Sweden	20
Denmark	18
Belgium	14
Luxemburg	9
Czechoslovakia	7
Germany (East)	6
Norway	6
Austria	5
Spain	5
India	4
Poland	4
Greece	3
Morocco	3
U.S.S.R.	3

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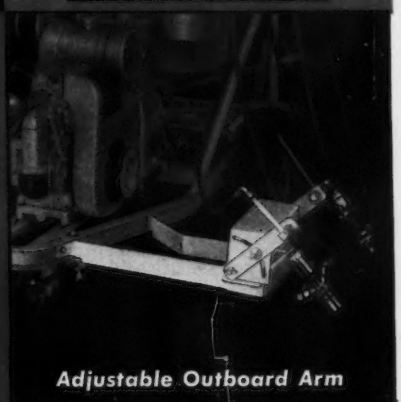
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Algeria	1
Lebanon	1
Libya	1
South Africa	1
United Nations	2

A number of participants expressed to this writer their personal regrets that participation by American engineers was so limited. The reason is, of course, the high cost involved in traveling to the site of the conference. However, any traffic engineer who is planning to spend a vacation in Europe in any case might well consider arranging it to coincide with a future Study Week. Not only will he receive substantial tax benefits (since his transatlantic fare, for instance, will be a deductible business expense) but he will also find the conference a most stimulating and educational experience. The next International Study Week in Traffic Engineering is tentatively scheduled for June or September of 1958 in Copenhagen.

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